United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with Illinois
Agricultural Experiment
Station

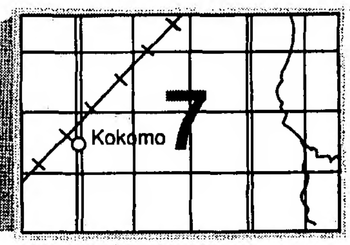
Soil Survey of Washington County, Illinois

How to Use This Soil Survey

General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

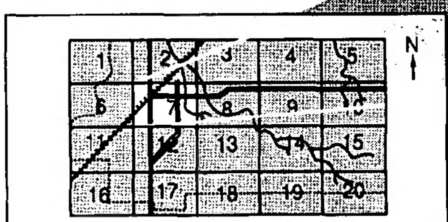
To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.



MAP SHEET

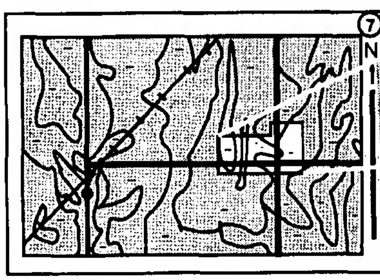
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.

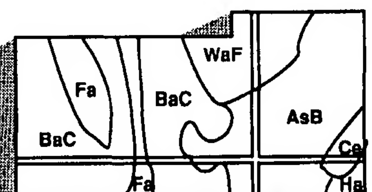


INDEX TO MAP SHEETS

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet and turn to that sheet.



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

Locate your area of interest on the map sheet. Note the map units symbols that are in that area. Turn to the **Contents**, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Contents** shows which table has data on a specific land use for each detailed soil map unit. Also see the **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1991. Soil names and descriptions were approved in 1993. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1991. This survey was made cooperatively by the Natural Resources Conservation Service and the Illinois Agricultural Experiment Station. It is part of the technical assistance furnished to the Washington County Soil and Water Conservation District. Additional funding was provided by the Washington County Board and the Illinois Department of Agriculture.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

This survey is Illinois Agricultural Experiment Station Soil Report 162.

Cover: The corn in the foreground is in an area of Wilbur soils. The sloping areas of Hickory soils in the background are used for hay or woodland.

Contents

Issued 1998

Foreword

This soil survey contains information that can be used in land-planning programs in Washington County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

William J. Gradle
State Conservationist
Natural Resources Conservation Service

Soil Survey of Washington County, Illinois

By Larry R. Sabata, Natural Resources Conservation Service

Soils surveyed by Larry R. Sabata and William M. McCauley, Natural Resources Conservation Service, and Kent D. Brinkman and Marsha R. Gajewski, Washington County

United States Department of Agriculture, Natural Resources Conservation Service, in cooperation with
the Illinois Agricultural Experiment Station

WASHINGTON COUNTY is in the southwestern part of Illinois (fig. 1). It has an area of 360,900 acres, or 564 square miles. It is bordered on the north by Clinton County, on the east by Marion and Jefferson Counties, on the south by Perry and Randolph Counties, and on the west by St. Clair County. Nashville, the county seat, is about 50 miles east of the metropolitan area of St. Louis. In 1990, the population of Washington County was 14,965 (U.S. Department of Commerce, 1991). Nashville had a population of 3,201.

This soil survey updates the soil survey of Washington County published in June 1937 (Smith and Smith, 1937). It provides more recent information about the soils and has larger maps, which show the soils in greater detail.

General Nature of the County

This section provides general information about the county. It describes history and development; natural resources; relief, physiography, and drainage; and climate.

History and Development

The first pioneer settlements in the Washington County area were established in about 1810 in the vicinity of present-day Covington. During this time the area was part of St. Clair County. In 1817, Washington County was formed. Included within its boundary was part of present-day Clinton County (Historical Society of Washington County, 1968). Covington was the first county seat. In 1824, the present boundaries of Washington County were established (State of Illinois). The county seat was moved to Nashville in 1831.

Agriculture and agribusiness are the major enterprises in the county. A few light industrial plants, an underground coal mine, and several producing oil fields also contribute to the economy.

The major transportation facilities in the county include railroads, Interstate 64, U.S. Highway 51, and State Highways 15, 127, 153, 160, and 177.

Natural Resources

Soil is the major natural resource in Washington County. Most of the land is used for agriculture. Other important resources include water, oil, coal, timber, and wildlife.

Many ponds and dams are in the county. Most areas do not have adequate underground water supplies and are dependent on good-quality surface water. The Kaskaskia River provides a source of water for wildlife and a variety of recreational uses. A coal mine and several producing oil fields are in the county. Woodland areas are concentrated in the more sloping areas and on the flood plains. There are several sawmills for cutting and processing timber.

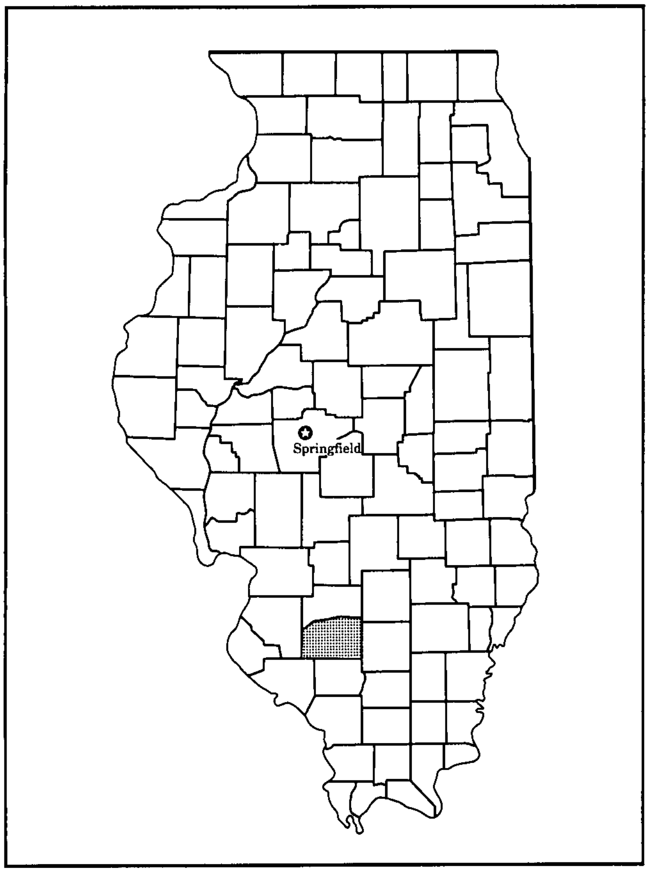


Figure 1.—Location of Washington County in Illinois.

The woodland areas provide habitat for a variety of wildlife species. Deer and squirrel are among the most commonly hunted game species.

Relief, Physiography, and Drainage

The landscape of Washington County is made up of three major landforms—till plains, stream terraces, and flood plains. These landforms are the products of continental glaciation and more recent stream erosion. The deposition of glacial till and loess and succeeding postglacial stream erosion have modified the original bedrock topography and created the present terrain.

The till plains make up the majority of the land area in Washington County. These areas consist of crests, interfluves, and broad summits that break off to head slopes, side slopes, and back slopes where nearby stream channels are dissecting the landscape. Summit elevations range from about 595 feet above sea level in the east-central part of the county to about 420 feet above sea level in the northwestern part.

The stream terraces are primarily in the northwestern part of the county. They consist of treads and breaks that are remnants of a previous flood plain. Recent downcutting and channelization along the current active flood plain have left the stream terrace positions at elevations that are no longer subject to flooding. Tread elevations range from about 405 to 410 feet above sea level.

The flood plains in the county are primarily along the Kaskaskia River, the Little Muddy River, Beaucoup Creek, Mud Creek, Elkhorn Creek, Plum Creek, and Crooked Creek and the adjoining tributaries of these streams. Mud, Elkhorn, Plum, and Crooked Creeks flow either north or west into the Kaskaskia River, which flows south and west as it leaves the county. The Little Muddy River and Beaucoup Creek flow south out of the county. The flood plains consist of meander scrolls near the stream channels and backswamps in areas farther away. Elevations on the flood plains range from about 445 to 460 feet above sea level in the southeastern part of the county to about 395 feet above sea level in the northwest corner, on the flood plain along the Kaskaskia River.

Climate

Wayne Wendland, Illinois State Water Survey, helped prepare this section.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Nashville in the period 1961 to 1990. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter, the average temperature is 32.7 degrees F and the average daily minimum temperature is 23.8 degrees. The lowest temperature on record, which occurred at Nashville on December 22, 1989, is -12 degrees F. In summer, the average temperature is 76.1 degrees and the average daily maximum temperature is 86.7 degrees. The highest recorded temperature, which occurred at Nashville on July 15, 1980, is 106 degrees F.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 39.11 inches. Of this, 20.91 inches, or about 53 percent, usually falls

in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 10.50 inches. The heaviest 1-day rainfall during the period of record was 4.70 inches.

Tornadoes, hail, and severe thunderstorms occur occasionally. They generally are of small extent and of short duration and cause damage in narrow belts or localized areas.

The average seasonal snowfall is 17.7 inches. The greatest snow depth at any one time during the period of record was 33 inches. On the average, 18 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 65 percent. Humidity is higher at night, and the average at dawn is about 84 percent. The sun shines 68 percent of the time possible in summer and 40 percent in winter. The prevailing wind is from the southwest. Average windspeed is highest, 11.9 miles per hour, in March.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table

within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Some of the map units in the soil surveys of the adjacent Clinton, Marion, Perry, and Randolph Counties have either different surface textures or slightly different slope ranges than the adjoining map units of the same soil series in the survey of Washington County. These differences generally do not significantly affect the use or management of the soils for planning or interpretations. Because the differences may interfere with computerized transfer and manipulation of data, however, it is suggested that the user consult the local offices of the Natural Resources Conservation Service for the most current information available.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map in this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

Soil Descriptions

1. Bluford-Hoyleton-Wynoose Association

Nearly level and gently sloping, somewhat poorly drained and poorly drained soils that formed in loess and in the underlying silty and loamy sediments; on till plains

This association consists of soils on crests, interfluves, side slopes, head slopes, and broad summits on till plains. Slopes range from 0 to 5 percent.

This association makes up about 16 percent of the county. It is about 37 percent Bluford soils, 27 percent Hoyleton soils, 7 percent Wynoose soils, and 29 percent soils of minor extent (fig. 2).

Bluford soils are on nearly level broad summits and gently sloping crests, interfluves, side slopes, and head slopes. These soils are somewhat poorly drained. Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsurface layer is light brownish gray, friable silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown, mottled, firm silty clay. The next part is brown, mottled, firm silty clay loam. The lower part is light brownish gray, mottled, friable silt loam.

Hoyleton soils are on nearly level broad summits and gently sloping crests and interfluves. These soils are somewhat poorly drained. Typically, the surface layer is very dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is brown, mottled, friable silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown, mottled, firm silty clay loam. The next part is grayish brown, mottled, friable silty clay loam. The lower part is grayish brown, mottled, friable silt loam.

Wynoose soils are on nearly level broad summits. These soils are poorly drained. Typically, the surface layer is grayish brown, friable silt loam about 8 inches thick. The subsurface layer is light brownish gray, mottled, friable silt loam about 13 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is light brownish gray, mottled, firm silty clay loam. The next part is light brownish gray, mottled, friable silty clay loam. The lower part is gray, mottled, friable silt loam.

Of minor extent in this association are Ava, Birds, Blair, Coulterville, Darmstadt, Hickory, and Wilbur soils. The moderately well drained Ava soils are on crests, interfluves, and side slopes that are near drainageways. The poorly drained Birds and moderately well drained Wilbur soils are on narrow flood plains. The somewhat poorly drained Blair and well drained Hickory soils are in the more sloping areas near drainageways. The somewhat poorly drained Coulterville and Darmstadt soils have a high content of sodium in the subsoil. They are in landscape positions similar to those of the major soils.

Most areas of this association are used as cropland. The soils are suited to this use. The main management concerns are water erosion and wetness.

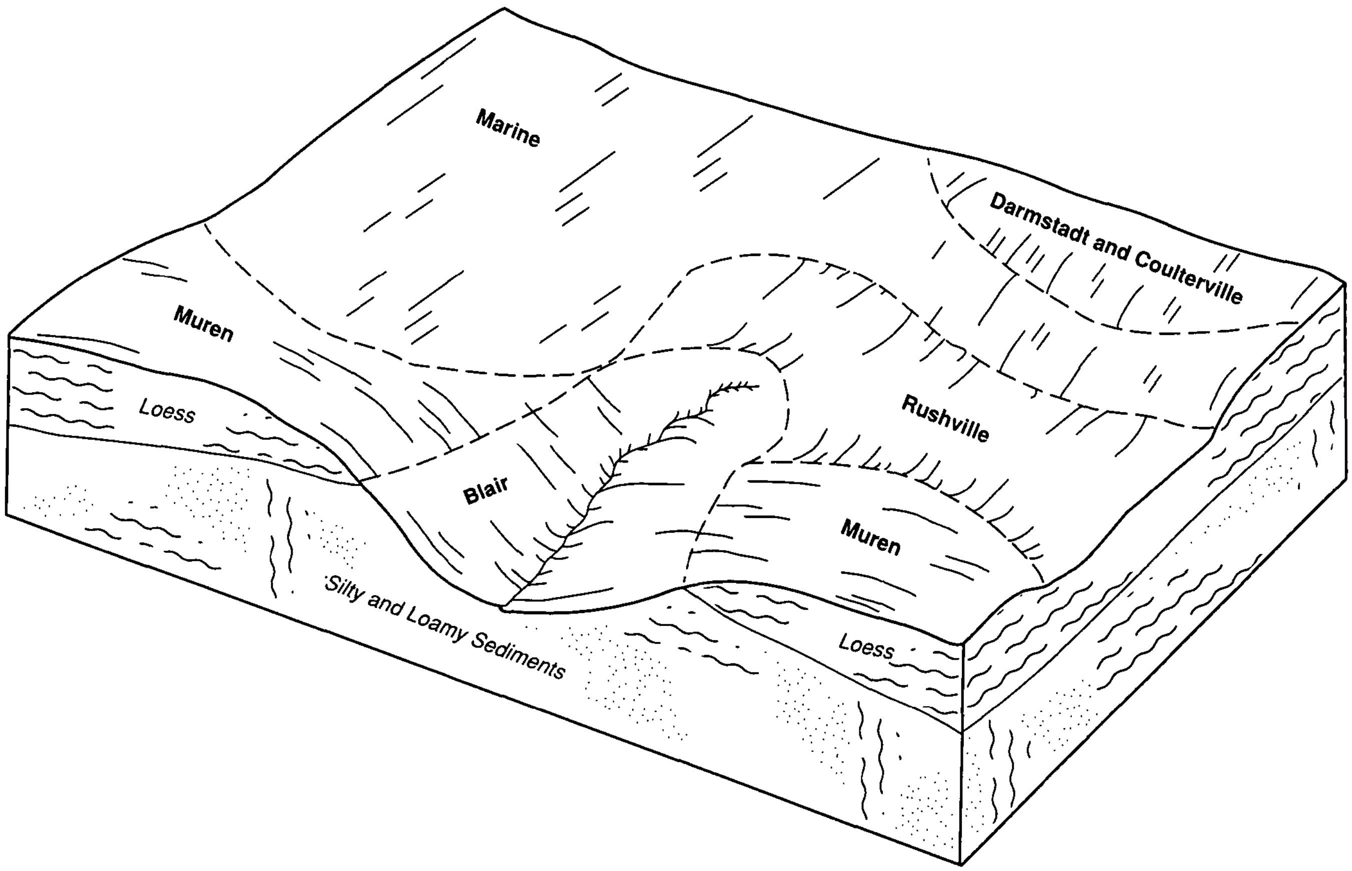


Figure 2.—Typical pattern of soils and parent material in the Bluford-Hoyleton-Wynoose association.

If areas of this association are used for building site development or sanitary facilities, the wetness, the shrink-swell potential, and restricted permeability are management concerns.

2. Marine-Rushville-Muren Association

Nearly level to moderately sloping, moderately well drained to poorly drained soils that formed in loess; on till plains

This association consists of soils on crests, interfluves, side slopes, head slopes, and broad summits on till plains. Slopes range from 0 to 10 percent.

This association makes up about 4 percent of the county. It is about 37 percent Marine soils, 20 percent Rushville soils, 18 percent Muren soils, and 25 percent soils of minor extent (fig. 3).

Marine soils are on nearly level broad summits. These soils are somewhat poorly drained. Typically, the surface layer is dark grayish brown, friable silt loam about 5 inches thick. The subsurface layer is grayish brown, mottled, friable silt loam about 9 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown, mottled, firm silty clay loam. The next part is brown, mottled, friable silty clay loam. The lower part is light gray, mottled, friable silt loam.

Rushville soils are on nearly level broad summits. These soils are poorly drained. Typically, the surface layer is dark grayish brown, friable silt loam about 10 inches thick. The subsurface layer is light brownish gray, mottled, friable silt loam about 10 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is grayish brown, mottled, firm silty clay. The next part is grayish brown, mottled, firm silty clay loam. The lower part is grayish brown, mottled, friable silt loam.

Muren soils are on gently sloping crests and interfluves and on moderately sloping side slopes and head slopes. These soils are moderately well drained. Typically, the surface layer is dark brown, friable silt loam about 7 inches thick. The subsurface layer is brown, friable silt loam about 5 inches thick. The subsoil is friable silty clay loam about 42 inches thick. It is mottled. The upper part is yellowish brown,

and the lower part is light brownish gray. The substratum to a depth of 60 inches or more is mottled light brownish gray and yellowish brown, friable silt loam.

Of minor extent in this association are Blair, Coulterville, Darmstadt, and Hosmer soils. The somewhat poorly drained Blair soils are on moderately sloping and strongly sloping side slopes and head slopes near drainageways. The somewhat poorly drained Coulterville and Darmstadt soils have a high content of sodium in the subsoil. They are in landscape positions similar to those of the major soils. The moderately well drained Hosmer soils have very slow permeability in the subsoil. They are on gently sloping crests and interfluves and on moderately sloping and strongly sloping side slopes.

Most areas of this association are used as cropland, pasture, or woodland. The soils are suited to these uses. The main management concerns are wetness, ponding, and water erosion.

If areas of this association are used for building site development or sanitary facilities, the wetness, the ponding, the shrink-swell potential, and restricted permeability are concerns.

3. Oconee-Darmstadt-Coulterville Association

Nearly level and gently sloping, somewhat poorly drained soils that formed in loess or in loess and in the underlying silty and loamy sediments; on till plains

This association consists of soils on nearly level broad summits and gently sloping crests, interfluves, side slopes, and head slopes on till plains. Slopes range from 0 to 5 percent.

This association makes up about 42 percent of the county. It is about 30 percent Oconee and similar soils, 28 percent Darmstadt soils, 8 percent Coulterville soils, and 34 percent soils of minor extent (fig. 4).

Oconee soils formed in loess. Typically, the surface layer is very dark gray, friable silt loam about 8 inches thick. The subsurface layer is dark grayish brown, mottled, friable silt loam about 11 inches thick. The subsoil is about 38 inches thick. The upper part is brown, mottled, firm silty clay loam. The next

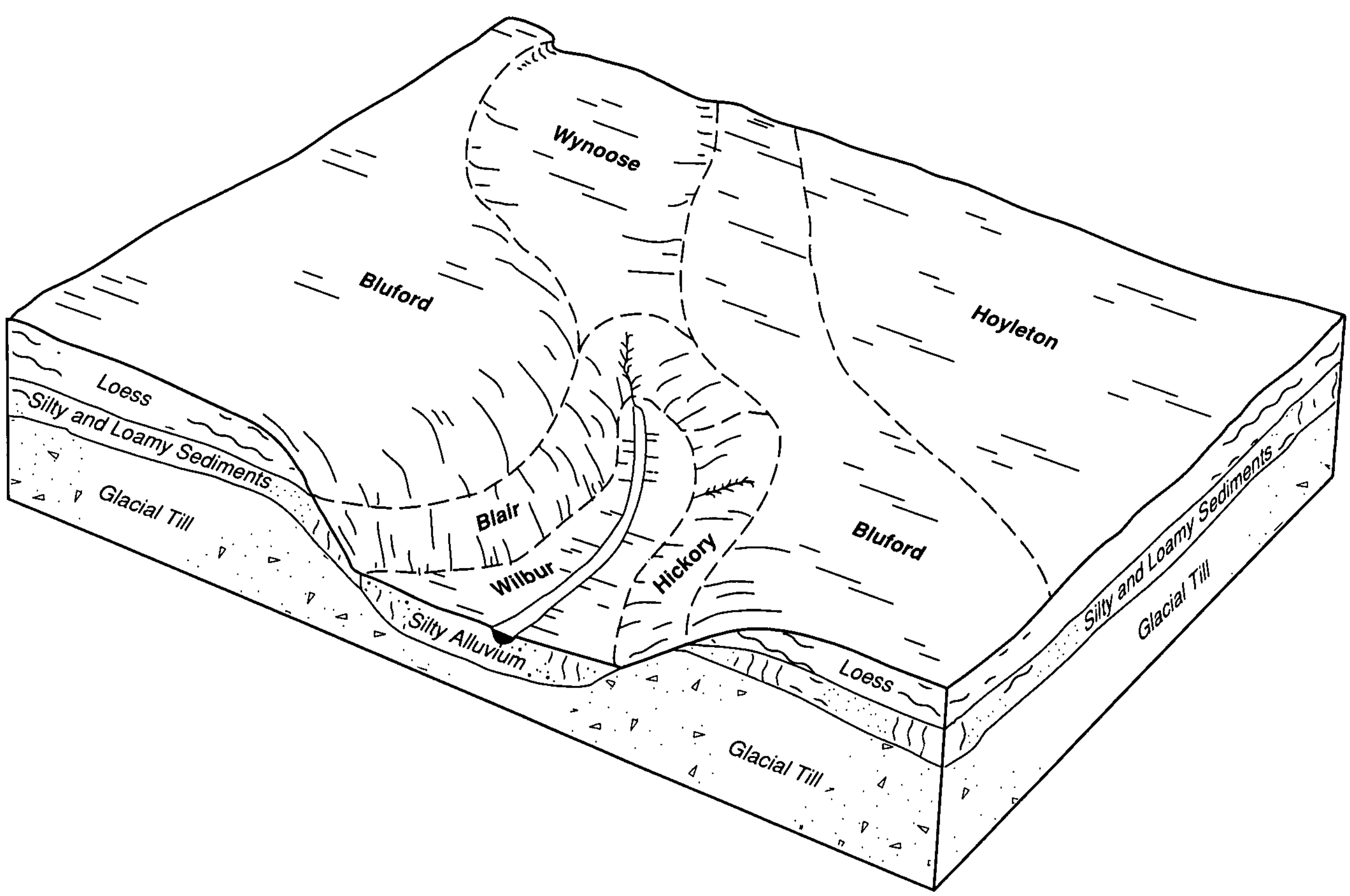


Figure 3.—Typical pattern of soils and parent material in the Marine-Rushville-Muren association.

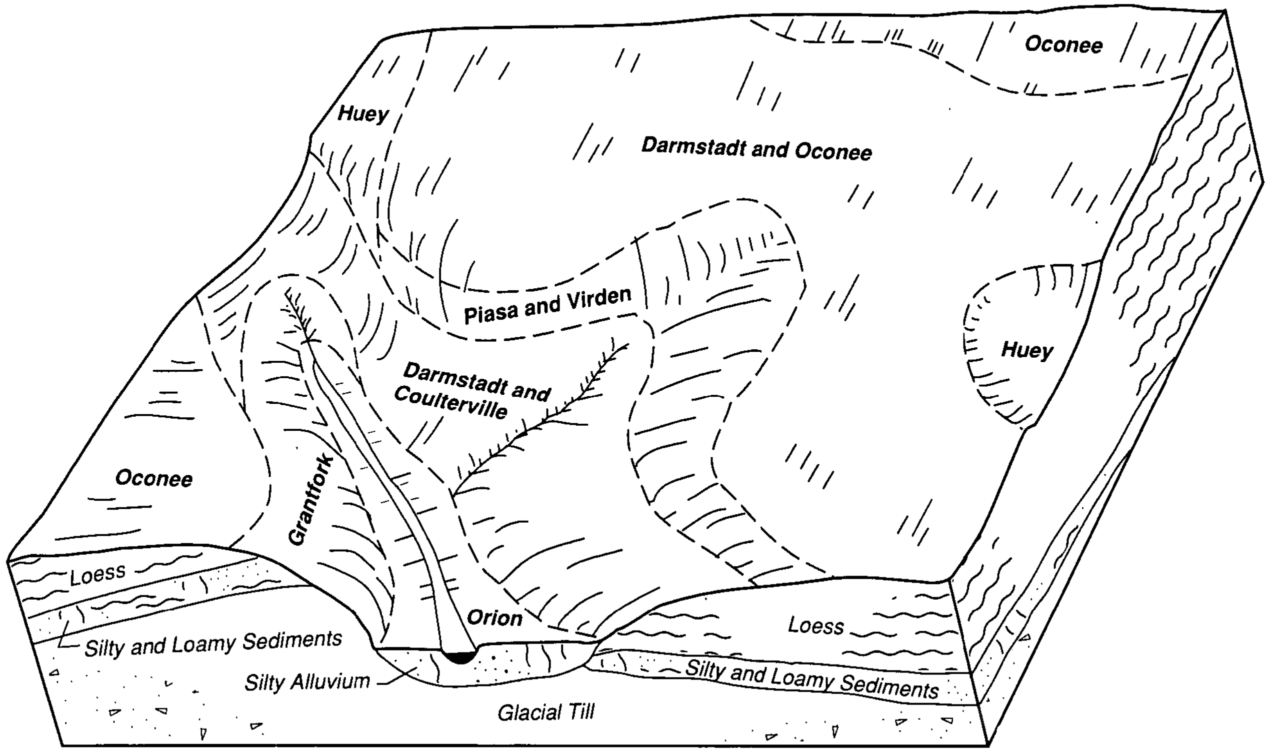


Figure 4.—Typical pattern of soils and parent material in the Oconee-Darmstadt-Coulterville association.

part is grayish brown, mottled, firm silty clay loam. The lower part is grayish brown, mottled, friable silt loam. The substratum to a depth of 60 inches or more is light brownish gray, mottled, friable silt loam.

Darmstadt soils formed in loess or in loess and in the underlying silty and loamy sediments. Typically, the surface layer is dark grayish brown, friable silt loam about 8 inches thick. The subsurface layer is grayish brown, friable silt loam about 5 inches thick. The subsoil is about 38 inches thick. The upper part is brown, mottled, firm silty clay loam. The next part is light brownish gray, mottled, friable silty clay loam. The lower part is light gray, mottled, friable silt loam. The substratum to a depth of 60 inches or more also is light gray, mottled, friable silt loam.

Coulterville soils formed in loess or in loess and in the underlying silty and loamy sediments. Typically, the surface layer is brown, friable silt loam about 5 inches thick. The subsoil is about 46 inches thick. The upper part is brown, mottled, firm silty clay loam. The next part is brown, mottled, friable silty clay loam. The lower part is dark grayish brown, mottled, friable silt loam. The substratum to a depth of 60 inches or more is grayish brown, mottled, friable silt loam.

Of minor extent in this association are Birds, Blair, Grantfork, Hickory, Huey, Muren, Orion, Piasa, Rushville, and Virden soils. The poorly drained Birds and somewhat poorly drained Orion soils are on narrow flood plains. The somewhat poorly drained Blair and Grantfork soils and the well drained Hickory soils are in the more sloping areas near drainageways. The poorly drained Huey, Piasa, Rushville, and Virden soils are on nearly level broad summits that are subject to ponding. The moderately well drained Muren soils are on crests, interfluves, side slopes, and head slopes near drainageways.

Most areas of this association are used as cropland. The soils are suited to this use. The main management concerns are water erosion, wetness, excess sodium, and a limited available water capacity.

If areas of this association are used for building site development or sanitary facilities, the wetness, the shrink-swell potential, and restricted permeability are concerns.

4. Bluford-Hickory-Blair Association

Nearly level to steep, somewhat poorly drained and well drained soils that formed in loess and in the underlying silty and loamy sediments, in loess and glacial till, in glacial till, and in silty and loamy sediments; on till plains

This association consists of soils on crests, interfluves, side slopes, head slopes, back slopes, and broad summits on till plains. Slopes range from 0 to 60 percent.

This association makes up about 15 percent of the county. It is about 24 percent Bluford soils, 22 percent Hickory soils, 18 percent Blair soils, and 36 percent soils of minor extent (fig. 5).

Bluford soils formed in loess and in the underlying silty and loamy sediments. These soils are on nearly level broad summits and gently sloping crests, interfluves, side slopes, and head slopes. They are somewhat poorly drained. Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsurface layer is light brownish gray, friable silt loam about 7 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown, mottled, firm silty clay. The next part is brown, mottled, firm silty clay loam. The lower part is light brownish gray, mottled, friable silt loam.

Hickory soils formed in glacial till with a thin mantle of loess or in glacial till. These soils are on strongly sloping to steep side slopes and back slopes. They are well drained. Typically, the surface layer is very dark grayish brown, friable silt loam about 3 inches thick. The subsurface layer is brown, friable silt loam about 9 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, friable loam. The next part is yellowish brown, firm clay loam. The lower part is yellowish brown, mottled, firm clay loam.

Blair soils formed in silty and loamy sediments. These soils are on moderately sloping and strongly sloping side slopes and head slopes. They are somewhat poorly drained. Typically, the surface layer is brown, friable silt loam about 6 inches thick. The subsoil to a depth of more than 60 inches is friable silty clay loam. It is mottled. The upper part is yellowish brown, and the lower part is grayish brown.

Of minor extent in this association are Ava, Birds, Grantfork, Wellston, and Wilbur soils. The moderately well drained Ava soils are on gently sloping crests and interfluves and on moderately sloping crests and

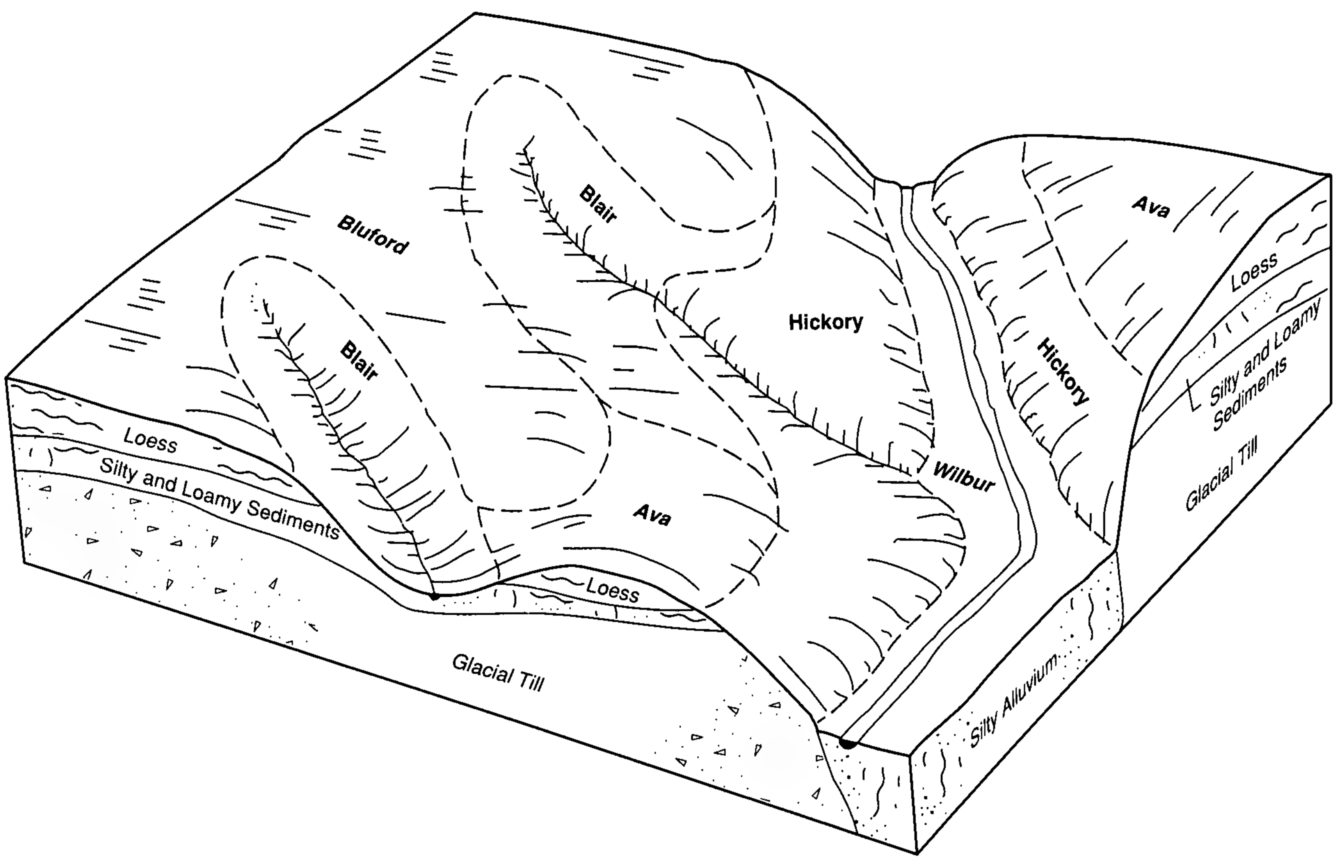


Figure 5.—Typical pattern of soils and parent material in the Bluford-Hickory-Blair association.

side slopes. The poorly drained Birds and moderately well drained Wilbur soils are on narrow flood plains. The somewhat poorly drained Grantfork soils have a high content of sodium in the subsoil. They are on moderately sloping and strongly sloping side slopes and head slopes. The well drained Wellston soils are underlain by sandstone or siltstone below a depth of 40 inches. They are on moderately steep and steep side slopes and back slopes below the major soils.

Most areas of this association are used as woodland, pasture, or cropland. The nearly level to moderately sloping soils are suited to cropland. The strongly sloping soils are better suited to a crop rotation that includes a forage crop, to permanent hay or pasture, or to woodland. The moderately steep soils are best suited to pasture and woodland. The steep soils are best suited to woodland. The main management concerns are water erosion, the slope, and wetness.

If areas of this association are used for building site development or sanitary facilities, the wetness, the shrink-swell potential, the slope, and restricted permeability are concerns.

5. Muren-Blair-Hickory Association

Gently sloping to steep, somewhat poorly drained to well drained soils that formed in loess, in silty and loamy sediments, in loess and glacial till, and in glacial till; on till plains

This association consists of soils on crests, interfluves, side slopes, head slopes, and back slopes on till plains. Slopes range from 2 to 60 percent.

This association makes up about 16 percent of the county. It is about 29 percent Muren and similar soils, 14 percent Blair soils, 14 percent Hickory soils, and 43 percent soils of minor extent.

Muren soils formed in loess. These soils are on gently sloping crests and interfluves and on moderately sloping side slopes and head slopes. They are moderately well drained. Typically, the surface layer is dark brown, friable silt loam about 7 inches thick. The subsurface layer is brown, friable silt loam about 5 inches thick. The subsoil is friable silty clay loam about 42 inches thick. It is mottled. The upper part is yellowish brown, and the lower part is light brownish gray. The substratum to a depth of 60 inches or more is mottled light brownish gray and yellowish brown, friable silt loam.

Blair soils formed in silty and loamy sediments. These soils are on moderately sloping and strongly sloping side slopes and head slopes. They are somewhat poorly drained. Typically, the surface layer is brown, friable silt loam about 6 inches thick. The subsoil to a depth of more than 60 inches is friable silty clay loam. It is mottled. The upper part is yellowish brown, and the lower part is grayish brown.

Hickory soils formed in glacial till with a thin mantle of loess or in glacial till. These soils are on strongly sloping to steep side slopes and back slopes. They are well drained. Typically, the surface layer is very dark grayish brown, friable silt loam about 3 inches thick. The subsurface layer is brown, friable silt loam about 9 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is yellowish brown, friable loam. The next part is yellowish brown, firm clay loam. The lower part is yellowish brown, mottled, firm clay loam.

Of minor extent in this association are Birds, Grantfork, Hosmer, Marine, Wellston, and Wilbur soils. The poorly drained Birds and moderately well drained Wilbur soils are on narrow flood plains. The somewhat poorly drained Grantfork soils have a high content of sodium in the subsoil. They are on moderately sloping and strongly sloping side slopes and head slopes. The moderately well drained Hosmer soils have very slow permeability in the subsoil. They are on gently sloping crests and interfluves and on moderately sloping and strongly sloping side slopes. The somewhat poorly drained Marine soils are on nearly level broad summits. The well drained Wellston soils are underlain by sandstone or siltstone below a depth of 40 inches. They are on moderately steep and steep side slopes and back slopes below the major soils.

Most areas of this association are used as woodland, pasture, or cropland. The gently sloping and moderately sloping soils are suited to these uses. The strongly sloping soils are better suited to a crop rotation that includes a forage crop, to permanent hay or pasture, or to woodland. The moderately steep soils are best suited to pasture and woodland. The steep soils are best suited to woodland. The main management concerns are water erosion and the slope.

If areas of this association are used for building site development or sanitary facilities, wetness, the shrink-swell potential, the slope, and restricted permeability are concerns.

6. Hurst-Okaw Association

Nearly level, somewhat poorly drained and poorly drained soils that formed in loess and in the underlying lacustrine sediments or alluvium; on stream terraces

This association consists of soils on treads on stream terraces. Slopes range from 0 to 2 percent.

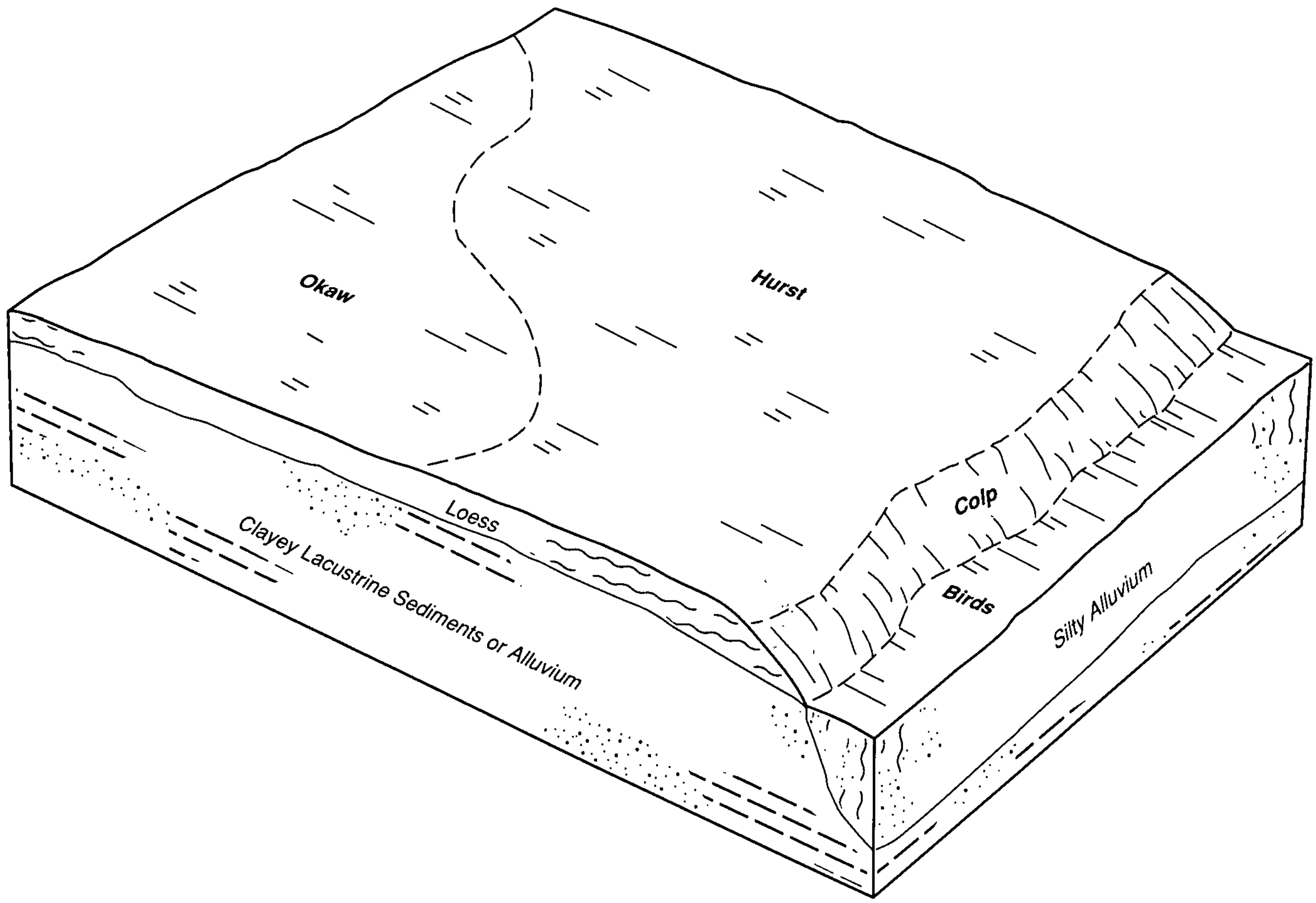


Figure 6.—Typical pattern of soils and parent material in the Hurst-Okaw association.

This association makes up about 1 percent of the county. It is about 58 percent Hurst soils, 19 percent Okaw and similar soils, and 23 percent soils of minor extent (fig. 6).

Hurst soils are somewhat poorly drained. Typically, the surface layer is dark grayish brown, friable silt loam about 5 inches thick. The subsurface layer also is dark grayish brown, friable silt loam about 5 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is brown, mottled, very firm silty clay. The next part is brown, mottled, firm silty clay loam. The lower part is light brownish gray, mottled, firm silty clay loam.

Okaw soils are poorly drained. Typically, the surface layer is dark grayish brown, friable silt loam about 6 inches thick. The subsurface layer is grayish brown, mottled, friable silt loam about 9 inches thick. The subsoil extends to a depth of more than 60 inches. The upper part is light brownish gray, mottled, firm silty clay loam. The next part is light brownish gray, mottled, very firm silty clay. The lower part is light brownish gray, mottled, firm silty clay loam.

Of minor extent in this association are Birds, Colp, Creal, and Geff soils. The poorly drained Birds soils are on flood plains. The moderately well drained Colp soils are on gently sloping breaks. The somewhat poorly drained Creal soils are in nearly level positions similar to those of the major soils. The somewhat poorly drained Geff soils are on gently sloping treads in slightly higher positions than those of the major soils.

Most areas of this association are used as cropland or woodland. The soils are suited to these uses. The main management concerns are wetness and ponding.

If areas of this association are used for building site development or sanitary facilities, the wetness, the ponding, flooding, the shrink-swell potential, and restricted permeability are concerns.

7. Birds-Wakeland Association

Nearly level, poorly drained and somewhat poorly drained soils that formed in silty alluvium; on flood plains

This association consists of soils on meander scrolls and in backswamps on flood plains. Slopes range from 0 to 2 percent.

This association makes up about 6 percent of the county. It is about 49 percent Birds soils, 34 percent Wakeland and similar soils, and 17 percent soils of minor extent.

Birds soils are on meander scrolls and in backswamps. These soils are poorly drained. Typically, the surface layer is dark grayish brown, mottled, friable silt loam about 9 inches thick. The substratum extends to a depth of more than 60 inches. The upper part is gray, mottled, friable silt loam. The next part is light gray, mottled, friable silt loam. The lower part is gray, mottled, friable, stratified silty clay loam and silt loam.

Wakeland soils are on meander scrolls. These soils are somewhat poorly drained. Typically, the surface layer is dark grayish brown, friable silt loam about 7 inches thick. The substratum to a depth of more than 60 inches is friable silt loam. It is mottled. The upper part is grayish brown, the next part is light brownish gray, and the lower part is grayish brown.

Of minor extent in this association are Colp, Geff, and Okaw soils. The moderately well drained Colp soils are on gently sloping breaks on stream terraces. The somewhat poorly drained Geff soils are on gently sloping treads on stream terraces. The poorly drained Okaw soils are on treads on stream terraces in positions slightly higher than those of the major soils.

Most areas of this association are used as cropland or woodland. Areas that have been drained are suited to cropland. Areas that have not been drained are better suited to woodland or to habitat for woodland and wetland wildlife. The main management concerns in drained areas are wetness, ponding, and flooding. The main management needs in areas that have not been drained are measures that maintain the habitat for woodland and wetland wildlife.

If areas of this association are used for building site development or sanitary facilities, the wetness, the ponding, the flooding, and restricted permeability are concerns.

Broad Land Use Considerations

The soils in Washington County range widely in their suitability for major land uses. About 78 percent of the county is used for cultivated crops, primarily soybeans, wheat, corn, and grain sorghum (U.S. Department of Commerce, 1989). A high percentage of the acreage used for wheat is double cropped with soybeans and, in a few places, grain sorghum. Associations 1, 2, 3, and 6 have the highest percentage of acreage in cultivated crops. Erosion is a management concern in associations 1, 2, 3, 4, and 5. A seasonal high water table is a concern in all of the associations. Flooding is a concern in association 7. Soils that have a high amount of sodium in the subsoil are a concern in association 3.

About 10 percent of the county is used for pasture and hay (U.S. Department of Commerce, 1989). Associations 2, 4, and 5 have the highest percentage of acreage in pasture and hay. All of the associations in the county are suited to forage crops. Forage species that are tolerant of wetness are needed in associations 1, 2, 6, and 7. The slope is a concern affecting livestock grazing in associations 4 and 5.

About 6 percent of the county is woodland (U.S. Department of Commerce, 1989). Most of the woodland is in associations 2, 4, 5, 6, and 7. Plant competition is a management concern in these associations. Erosion is a concern in associations 4 and 5. Windthrow and seedling mortality are concerns in associations 6 and 7. The equipment limitation is a concern in areas of the moderately steep and steep soils in associations 4 and 5 and in areas of the poorly drained soils in associations 6 and 7.

A few areas in the county are used for urban development. Areas to be used for urban development should be carefully selected. The general soil map is helpful in planning general areas, but it cannot be used for selecting specific construction sites. The soils in all of the associations have limitations affecting urban development. Some limitations can be overcome more easily than others. If areas are selected for urban development, the amount of prime farmland in a given area should be considered in addition to the limitations of the soils. Associations 6 and 7 are generally unsuited to urban development because of flooding. Wetness, the shrink-swell potential, and restricted permeability are concerns in associations 1, 2, 3, 4, and 5. Ponding is a concern in associations 2, 6, and 7. The slope is a concern in areas of the strongly sloping to steep soils in associations 4 and 5.

The suitability of the soils for recreational uses ranges from good to poor, depending upon the intensity of the expected use. All of the associations are suitable for some recreational uses. Associations 1 and 3 generally have the fewest limitations affecting

most recreational uses. Ponding is a concern in association 2. Flooding and ponding are concerns in associations 6 and 7. The slope is a concern in areas of the strongly sloping to steep soils in associations 4 and 5.

The suitability of the soils for wildlife habitat generally is good throughout the county in areas that are not used as cropland. Associations 4, 5, 6, and 7 have the largest acreage of woodland wildlife habitat. Association 7 also has a significant acreage of wetland wildlife habitat. The main management needs are measures that maintain suitable habitat for cover and nesting. All of the associations generally are suited to use as habitat for openland and woodland wildlife. Associations 1, 2, 6, and 7 generally have good potential for use as habitat for wetland wildlife.

Detailed Soil Map Units

The map units on the detailed soil maps in this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information is given under the heading "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the substratum. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Hickory silt loam, 10 to 15 percent slopes, eroded, is a phase of the Hickory series.

Some map units are made up of two or more major soils. These map units are called soil complexes. A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Piasa-Virden complex is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Urban land is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps (fig. 7).

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Contents") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

2—Cisne silt loam

Composition

Cisne and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Very slow
Available water capacity: High
Seasonal high water table: At the surface to 2 feet below the surface

Figure 7.—Small miscellaneous areas, such as this oil-waste land in an area of Hoyleton silt loam, 0 to 2 percent slopes, are identified by a special symbol on the soil maps.

Organic matter content: 2 to 3 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 12 inches—dark grayish brown, friable silt loam
12 to 17 inches—light brownish gray, mottled, friable silt loam

Subsoil:
17 to 20 inches—grayish brown, mottled, friable silty clay loam
20 to 38 inches—grayish brown, mottled, firm silty clay
38 to 48 inches—grayish brown, mottled, firm silty clay loam
48 to 60 inches—light brownish gray, mottled, friable silty clay loam

Inclusions

Contrasting inclusions:
• The poorly drained Huey soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Cisne soil
• Soils that have a seasonal high water table ponded on the surface

Similar soils:
• Soils that have a lighter colored surface layer
• Soils that have less clay in the subsoil
• Soils that have less sand in the lower part of the subsoil

• Soils that have a seasonal high water table at a depth of more than 2 feet

Use and Management

Cropland

Suitability: Moderate
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the infiltration rate and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Generally unsuited because of the wetness and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the wetness and the very slow permeability

Interpretive Groups

Land capability classification: IIIw

3A—Hoyleton silt loam, 0 to 2 percent slopes

Composition

Hoyleton and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 5 to 200 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 2 to 3 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 12 inches—brown, friable silt loam
12 to 15 inches—brown, mottled, friable silt loam

Subsoil:
15 to 27 inches—brown, mottled, firm silty clay loam
27 to 34 inches—brown, mottled, friable silty clay loam
34 to 46 inches—grayish brown, mottled, friable silty clay loam
46 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Hoyleton soil
• Soils that have a seasonal high water table ponded on the surface
• Soils that have slopes of more than 2 percent

Similar soils:
• Soils that have a lighter colored surface layer
• Soils that have less clay in the subsoil
• Soils that have less sand in the lower part of the subsoil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water infiltration.

• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of this soil.

Interpretive Groups

Land capability classification: IIw

3B—Hoyleton silt loam, 2 to 5 percent slopes

Composition

Hoyleton and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Interfluves, crests, side slopes, and head slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 2 to 3 percent
Erosion hazard: Moderate
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 8 inches—dark brown, friable silt loam

Subsurface layer:
8 to 12 inches—brown, friable silt loam

Subsoil:
12 to 20 inches—brown, mottled, firm silty clay loam
20 to 29 inches—brown, mottled, firm silty clay
29 to 46 inches—grayish brown, mottled, friable silty clay loam
46 to 52 inches—grayish brown, mottled, friable silt loam

Substratum:
52 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Hoyleton soil
• Soils that have slopes of less than 2 percent

Similar soils:
• Soils that have a lighter colored surface layer
• Soils that have less clay in the subsoil
• Soils that are moderately eroded
• Soils that have less sand in the lower part of the subsoil and in the substratum

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Maintaining surface ditches helps to remove excess water.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited

Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily in areas of this soil if the site is leveled.

Interpretive Groups

Land capability classification: IIe

4B—Richview silt loam, 2 to 5 percent slopes

Composition

Richview and similar soils: 100 percent

Setting

Landform: Till plains
Position on the landform: Crests
Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: 2 to 3 percent
Erosion hazard: Moderate
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 13 inches—dark grayish brown, mottled, friable silt loam

Subsoil:
13 to 21 inches—yellowish brown, mottled, firm silty clay loam
21 to 28 inches—yellowish brown, mottled, friable silty clay loam
28 to 42 inches—yellowish brown, mottled, friable silt loam
42 to 60 inches—strong brown, mottled, friable silt loam

Inclusions

Similar soils:
• Soils that have a lighter colored surface layer
• Soils that have a seasonal high water table at a depth of 2 to 4 feet
• Soils that are moderately eroded
• Soils that have less sand in the lower part of the subsoil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains near the foundations helps to lower the water table on sites for dwellings with basements.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• Subsurface tile drains help to lower the seasonal high water table.
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIe

4C2—Richview silt loam, 5 to 10 percent slopes, eroded

Composition

Richview and similar soils: 100 percent

Setting

Landform: Till plains
Position on the landform: Crests and side slopes
Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: 2 to 3 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 6 inches—very dark grayish brown, friable silt loam

Subsoil:
6 to 11 inches—yellowish brown, friable silt loam
11 to 17 inches—strong brown, friable silty clay loam
17 to 39 inches—brown, mottled, friable silty clay loam
39 to 60 inches—brown, mottled, friable silt loam

Inclusions

Similar soils:
• Soils that have a lighter colored surface layer
• Soils that have a seasonal high water table at a depth of more than 6 feet

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains near the foundations helps to lower the water table on sites for dwellings with basements.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• Subsurface tile drains help to lower the seasonal high water table.
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIIe

5C2—Blair silt loam, 5 to 10 percent slopes, eroded

Composition

Blair and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 6 inches—brown, friable silt loam

Subsoil:
6 to 38 inches—yellowish brown, mottled, friable silty clay loam
38 to 60 inches—grayish brown, mottled, friable silty clay loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Blair soil
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are not eroded
• Soils that have slopes of less than 5 percent
• Soils that have slopes of more than 10 percent
• Soils that have slow permeability in the subsoil
• Soils that have an apparent water table at a depth of more than 3.5 feet

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates (fig. 8), rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface tile drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Figure 8.—Using proper stocking rates helps to keep the pasture in good condition in this area of Blair silt loam, 5 to 10 percent slopes, eroded.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIIe

5C3—Blair silt loam, 5 to 10 percent slopes, severely eroded

Composition

Blair and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes

Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 3 inches—brown, friable silt loam

Subsoil:
3 to 23 inches—grayish brown, mottled, friable silt loam
23 to 38 inches—gray, mottled, friable silt loam
38 to 43 inches—dark grayish brown, mottled, friable silty clay loam
43 to 60 inches—gray, mottled, friable silty clay loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Blair soil
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are moderately eroded
• Soils that have slopes of less than 5 percent
• Soils that have slopes of more than 10 percent
• Soils that have slow permeability in the subsoil
• Soils that have an apparent water table at a depth of more than 3.5 feet

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, and a crop rotation that is dominated by forage crops help to control further water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface tile drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IVe

5D—Blair silt loam, 10 to 15 percent slopes

Composition

Blair and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major uses: Pasture and woodland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty and loamy sediments
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown, friable silt loam

Subsurface layer:
5 to 11 inches—yellowish brown, mottled, friable silt loam

Subsoil:
11 to 17 inches—yellowish brown, mottled, friable silt loam
17 to 26 inches—grayish brown, mottled, friable silty clay loam
26 to 43 inches—grayish brown, mottled, friable silt loam
43 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Blair soil
• The moderately well drained Wilbur soils on narrow flood plains
• The somewhat poorly drained Atlas soils, which have more clay in the subsoil than the Blair soil; in landscape positions similar to those of the Blair soil
• The well drained Hickory soils on back slopes and the more convex side slopes

Similar soils:
• Soils that are moderately eroded
• Soils that have slopes of less than 10 percent
• Soils that have slopes of more than 15 percent

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, and a crop rotation that is dominated by forage crops help to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited

Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Subsurface drains help to lower the water table.
• Land shaping by cutting and filling helps to overcome the slope.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IVe

5D3—Blair silt loam, 10 to 15 percent slopes, severely eroded

Composition

Blair and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty and loamy sediments
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface.
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 3 inches—dark yellowish brown, friable silt loam

Subsoil:
3 to 7 inches—yellowish brown, friable silt loam
7 to 30 inches—yellowish brown, mottled, friable silt loam
30 to 37 inches—brown, mottled, friable silt loam
37 to 60 inches—grayish brown, mottled, friable loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Blair soil
• The moderately well drained Wilbur soils on narrow flood plains
• The somewhat poorly drained Atlas soils, which have more clay in the subsoil than the Blair soil; in landscape positions similar to those of the Blair soil
• The well drained Hickory soils on back slopes and the more convex side slopes

Similar soils:
• Soils that are moderately eroded
• Soils that have slopes of less than 10 percent
• Soils that have slopes of more than 15 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Subsurface drains help to lower the water table.
• Land shaping by cutting and filling helps to overcome the slope.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: VIe

7D3—Atlas silty clay loam, 10 to 15 percent slopes, severely eroded

Composition

Atlas and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Paleosol formed in glacial till with a thin mantle of loess
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 7 inches—brown, friable silty clay loam

Subsoil:
7 to 12 inches—grayish brown, mottled, firm silty clay loam
12 to 27 inches—grayish brown, mottled, firm silty clay
27 to 50 inches—gray, mottled, firm clay loam
50 to 60 inches—gray, mottled, firm clay

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Atlas soil
• The moderately well drained Wilbur soils on narrow flood plains
• The somewhat poorly drained Blair soils, which have less clay in the subsoil than the Atlas soil; in landscape positions similar to those of the Atlas soil
• The well drained Hickory soils on back slopes and the more convex side slopes

Similar soils:
• Soils that are moderately eroded
• Soils that have slopes of less than 10 percent
• Soils that have slopes of more than 15 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• Planting larger seedlings than normal, eliminating competing vegetation, and mulching reduce the seedling mortality rate.
• Using harvesting methods that do not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Subsurface drains help to control the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Installing specially designed systems that include sand filters helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: VIe

8D2—Hickory silt loam, 10 to 15 percent slopes, eroded

Composition

Hickory and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and back slopes
Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial till with a thin mantle of loess
Runoff: Rapid
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 6 inches—brown, friable silt loam

Subsoil:
6 to 14 inches—dark yellowish brown, friable silt loam
14 to 25 inches—dark yellowish brown, friable silty clay loam
25 to 36 inches—yellowish brown, mottled, friable silty clay loam
36 to 60 inches—strong brown, mottled, friable clay loam

Inclusions

Contrasting inclusions:
• The well drained Alford soils and the moderately well drained Ava and Muren soils on the less sloping narrow interfluves
• The moderately well drained Wilbur soils on narrow flood plains
• The somewhat poorly drained Blair soils on head slopes and on the more concave side slopes

Similar soils:
• Soils that are not eroded
• Soils that have slopes of less than 10 percent
• Soils that have slopes of more than 15 percent
• Soils that have less sand in the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, and a crop rotation that is dominated by forage crops help to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly

adding other organic material help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Land shaping by cutting and filling helps to overcome the slope.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.
• Installing the filter lines on the contour or land shaping by cutting and filling helps to overcome the slope.

Interpretive Groups

Land capability classification: IIIe

8D3—Hickory silty clay loam, 10 to 15 percent slopes, severely eroded

Composition

Hickory and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and back slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 5 inches—yellowish brown, friable silty clay loam

Subsoil:
5 to 12 inches—yellowish brown, mottled, friable silty clay loam
12 to 41 inches—yellowish brown, mottled, friable clay loam
41 to 60 inches—yellowish brown, mottled, friable loam

Inclusions

Contrasting inclusions:
• The well drained Alford soils and the moderately well drained Ava and Muren soils on the less sloping narrow interfluves
• The moderately well drained Wilbur soils on narrow flood plains
• The somewhat poorly drained Blair soils on head slopes and on the more concave side slopes

Similar soils:
• Soils that are moderately eroded
• Soils that have slopes of less than 10 percent
• Soils that have slopes of more than 15 percent

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, and a crop rotation that is dominated by forage crops help to control further water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Eliminating livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Land shaping by cutting and filling helps to overcome the slope.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.
• Installing the filter lines on the contour or land shaping by cutting and filling helps to overcome the slope.

Interpretive Groups

Land capability classification: IVe

8E—Hickory silt loam, 15 to 30 percent slopes

Composition

Hickory and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and back slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Pasture and woodland (fig. 9)

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial till with a thin mantle of loess
Runoff: Rapid
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 3 inches—very dark grayish brown, friable silt loam

Subsurface layer:
3 to 12 inches—brown and yellowish brown, friable silt loam

Subsoil:
12 to 20 inches—yellowish brown, friable loam
20 to 25 inches—yellowish brown, firm clay loam
25 to 60 inches—yellowish brown, mottled, firm clay loam

Figure 9.—Woodland in an area of Hickory silt loam, 15 to 30 percent slopes.

Inclusions

Contrasting inclusions:
- The well drained Alford soils and the moderately well drained Ava and Muren soils on the less sloping narrow interfluves
- The moderately well drained Wilbur soils on narrow flood plains
- The well drained Wellston soils, which have sandstone or siltstone bedrock within a depth of 60 inches; on the lower parts of side slopes and back slopes
- The somewhat poorly drained Blair soils on the less sloping head slopes and side slopes

Similar soils:
- Soils that are moderately eroded
- Soils that have slopes of more than 30 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion and the slope

Pasture and hay

Management considerations:
- Establishing pasture and hay crops helps to control water erosion.

• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Using a no-till method of pasture renovation or seeding on the contour helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.
• Rotating the placement of salt or feed supplements or cross fencing improves forage utilization and grazing distribution.

Woodland

Management considerations:
• The slope increases the hazard of erosion and limits the use of equipment.
• Placing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, using grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging has been completed help to control erosion.
• The use of machinery is limited to periods when the soil is firm.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Wildlife habitat

Management considerations:
• In wooded areas the dense stands of timber provide good habitat for woodland wildlife.
• Measures that enhance wildlife habitat include providing a wide diversity of tree and shrub species for the greatest diversity of woodland wildlife species, maximizing shrub and brushy edge cover, protecting the understory by excluding livestock, retaining dead trees for cavity nesting, keeping fallen logs and brush piles as cover for prey species, and protecting the area from fire.

Dwellings

Suitability: Generally unsuited because of the slope

Septic tank absorption fields

Suitability: Generally unsuited because of the slope

Interpretive Groups

Land capability classification: VIe

8E3—Hickory clay loam, 15 to 30 percent slopes, severely eroded

Composition

Hickory and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and back slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 4 inches—brown, friable clay loam

Subsoil:
4 to 28 inches—yellowish brown, mottled, firm clay loam
28 to 38 inches—yellowish brown, mottled, friable clay loam
38 to 54 inches—brownish yellow, mottled, friable clay loam

Substratum:
54 to 60 inches—light brownish gray, mottled, friable loam

Inclusions

Contrasting inclusions:
• The well drained Alford soils and the moderately well drained Ava and Muren soils on the less sloping narrow interfluves

• The moderately well drained Wilbur soils on narrow flood plains
• The well drained Wellston soils, which have sandstone or siltstone bedrock within a depth of 60 inches; on the lower parts of side slopes and back slopes
• The somewhat poorly drained Blair soils on the less sloping head slopes and side slopes

Similar soils:
• Soils that are moderately eroded or uneroded
• Soils that have slopes of more than 30 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion (fig. 10) and the slope

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. Using a no-till method of pasture renovation or seeding on the contour helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.
• Rotating the placement of salt or feed supplements or cross fencing improves forage utilization and grazing distribution.

Woodland

Management considerations:
• The slope increases the hazard of erosion and limits the use of equipment.
• Placing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, using grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging has been completed help to control erosion.
• The use of machinery is limited to periods when the soil is firm.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the slope

Septic tank absorption fields

Suitability: Generally unsuited because of the slope

Interpretive Groups

Land capability classification: VIe

8G—Hickory silt loam, 30 to 60 percent slopes

Composition

Hickory and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and back slopes
Shape of areas: Irregular or long and narrow
Size of areas: 5 to 50 acres
Major use: Woodland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial till with a thin mantle of loess
Runoff: Very rapid
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 4 inches—dark grayish brown, friable silt loam

Subsurface layer:
4 to 10 inches—yellowish brown, friable silt loam

Subsoil:
10 to 21 inches—yellowish brown, friable loam

Figure 10.—Gully and rill erosion in an area of Hickory clay loam, 15 to 30 percent slopes, severely eroded.

21 to 27 inches—yellowish brown, friable clay loam
27 to 44 inches—yellowish brown, mottled, friable clay loam
44 to 60 inches—dark yellowish brown, mottled, friable clay loam

Inclusions

Contrasting inclusions:
• The moderately well drained Wilbur soils on narrow flood plains
• The well drained Wellston soils, which have sandstone or siltstone bedrock within a depth of 60 inches; on the lower parts of side slopes and back slopes

Similar soils:
• Soils that are moderately eroded
• Soils that have slopes of less than 30 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion and the slope

Woodland

Management considerations:
• The slope increases the hazard of erosion and limits the use of equipment.
• Placing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, using grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging has been completed help to control erosion.
• The use of machinery is limited to periods when the soil is firm.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Wildlife habitat

Management considerations:
• The dense stands of timber provide good habitat for woodland wildlife.
• Measures that enhance wildlife habitat include providing a wide diversity of tree and shrub species for the greatest diversity of woodland wildlife species, maximizing shrub and brushy edge cover, protecting the understory by excluding livestock, retaining dead trees for cavity nesting, keeping fallen logs and brush piles as cover for prey species, and protecting the area from fire.

Dwellings

Suitability: Generally unsuited because of the slope

Septic tank absorption fields

Suitability: Generally unsuited because of the slope

Interpretive Groups

Land capability classification: VIIe

12—Wynoose silt loam

Composition

Wynoose and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 3 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Very slow
Available water capacity: Moderate
Seasonal high water table: At the surface to 2 feet below the surface
Organic matter content: 1 to 2 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 8 inches—grayish brown, friable silt loam

Subsurface layer:
8 to 21 inches—light brownish gray, mottled, friable silt loam

Subsoil:
21 to 31 inches—light brownish gray, mottled, friable silty clay loam
31 to 37 inches—light brownish gray, mottled, firm silty clay loam
37 to 54 inches—light brownish gray, mottled, friable silty clay loam
54 to 60 inches—gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Huey soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Wynoose soil
• Soils that have a seasonal high water table ponded on the surface

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have less sand in the lower part of the subsoil
• Soils in which the seasonal high water table is at a depth of 2 to 3 feet

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas.

A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.
• Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the wetness and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the wetness and the very slow permeability

Interpretive Groups

Land capability classification: IIIw

13A—Bluford silt loam, 0 to 2 percent slopes

Composition

Bluford and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 10 to 300 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 2 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 9 inches—brown, friable silt loam

Subsurface layer:
9 to 16 inches—light brownish gray, friable silt loam

Subsoil:
16 to 38 inches—brown, mottled, firm silty clay loam
38 to 43 inches—brown, mottled, friable silt loam
43 to 54 inches—grayish brown, mottled, friable silt loam

Substratum:
54 to 60 inches—gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Bluford soil
• Soils that have slopes of more than 2 percent
• Soils that have a seasonal high water table ponded on the surface

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have less sand in the lower part of the subsoil and in the substratum

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.

• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, minimize surface compaction, and increase the rate of water infiltration.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of this soil.

Interpretive Groups

Land capability classification: IIw

13B—Bluford silt loam, 2 to 5 percent slopes

Composition

Bluford and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Crests, interfluves, side slopes, and head slopes
Shape of areas: Irregular
Size of areas: 10 to 300 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown, friable silt loam

Subsurface layer:
6 to 13 inches—light brownish gray, friable silt loam

Subsoil:
13 to 16 inches—brown, mottled, friable silty clay loam
16 to 28 inches—brown, mottled, firm silty clay
28 to 50 inches—brown, mottled, firm silty clay loam
50 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Bluford soil
• Soils that have slopes of less than 2 percent

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have less sand in the lower part of the subsoil
• Soils that are moderately eroded

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Maintaining surface ditches helps to remove excess water.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

• Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily in areas of this soil if the site is leveled.

Interpretive Groups

Land capability classification: IIe

13B2—Bluford silt loam, 2 to 5 percent slopes, eroded

Composition

Bluford and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Crests, side slopes, and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 5 inches—grayish brown, friable silt loam

Subsoil:
5 to 14 inches—brown, mottled, firm silty clay loam
14 to 22 inches—brown, mottled, friable silty clay loam
22 to 28 inches—grayish brown, mottled, friable silty clay loam
28 to 47 inches—grayish brown, mottled, friable silt loam

Substratum:
47 to 53 inches—dark grayish brown, mottled, friable silt loam
53 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Bluford soil

• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that have less clay in the subsoil
• Soils that are uneroded
• Soils that have slopes of more than 5 percent

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Further water erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces.
• Maintaining surface ditches helps to remove excess water.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily in areas of this soil if the site is leveled.

Interpretive Groups

Land capability classification: IIe

14B—Ava silt loam, 2 to 5 percent slopes

Composition

Ava and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Crests and interfluves
Shape of areas: Irregular
Size of areas: 3 to 50 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: Moderate
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 10 inches—brown, friable silt loam

Subsurface layer:
10 to 13 inches—yellowish brown, friable silt loam

Subsoil:
13 to 16 inches—light yellowish brown, friable silt loam
16 to 34 inches—brown, mottled, friable silty clay loam
34 to 54 inches—brown, mottled, firm silty clay loam
54 to 60 inches—yellowish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• Soils that have slopes of less than 2 percent

Similar soils:
• Soils that have more clay in the subsoil
• Soils that are moderately eroded
• Soils that have less sand in the lower part of the subsoil
• Soils that have slopes of more than 5 percent

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface tile drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIe

14C2—Ava silt loam, 5 to 10 percent slopes, eroded

Composition

Ava and similar soils: 100 percent

Setting

Landform: Till plains
Position on the landform: Crests and side slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Organic matter content: 1 to 2 percent

Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 6 inches—brown, friable silt loam

Subsoil:
6 to 18 inches—yellowish brown, mottled, friable silt loam
18 to 33 inches—yellowish brown, mottled, friable silty clay loam
33 to 40 inches—brown, mottled, firm silt loam
40 to 47 inches—mottled brown, yellowish brown, and dark yellowish brown, friable silt loam

Substratum:
47 to 57 inches—mottled brown, dark yellowish brown, and strong brown, friable loam
57 to 60 inches—brown, mottled, friable loam

Inclusions

Similar soils:
• Soils that are not eroded
• Soils that have more sand in the upper part of the subsoil
• Soils that have less sand in the lower part of the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface tile drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIIe

14C3—Ava silty clay loam, 5 to 10 percent slopes, severely eroded

Composition

Ava and similar soils: 100 percent

Setting

Landform: Till plains
Position on the landform: Side slopes

Shape of areas: Irregular
Size of areas: 3 to 5 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 4 inches—dark yellowish brown, friable silty clay loam

Subsoil:
4 to 35 inches—dark yellowish brown, mottled, firm silty clay loam
35 to 45 inches—strong brown, mottled, firm silty clay loam
45 to 60 inches—brown, mottled, friable silt loam

Inclusions

Similar soils:
• Soils that are moderately eroded
• Soils that have more sand in the upper part of the subsoil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, and a crop rotation that is dominated by forage crops help to control further water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface tile drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IVe

16—Rushville silt loam

Composition

Rushville and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Brief periods during the spring
Size of areas: 3 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: High
Seasonal high water table: 1 foot above to 1 foot below the surface
Organic matter content: 1 to 2 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 10 inches—dark grayish brown, friable silt loam

Subsurface layer:
10 to 16 inches—light brownish gray, mottled, friable silt loam
16 to 20 inches—grayish brown, mottled, friable silt loam

Subsoil:
20 to 35 inches—grayish brown, mottled, firm silty clay
35 to 45 inches—grayish brown, mottled, firm silty clay loam
45 to 55 inches—grayish brown, mottled, friable silty clay loam
55 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Marine soils in the slightly higher landscape positions that are not subject to ponding
• The poorly drained Huey soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Rushville soil

Similar soils:
• Soils that have less clay in the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.
• Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the ponding and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding and the very slow permeability

Interpretive Groups

Land capability classification: IIIw

46A—Herrick silt loam, 0 to 2 percent slopes

Composition

Herrick and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 3 to 4 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 9 inches—very dark gray, friable silt loam

Subsurface layer:
9 to 19 inches—very dark grayish brown, mottled, friable silt loam

Subsoil:
19 to 27 inches—dark grayish brown, mottled, firm silty clay loam
27 to 43 inches—brown, mottled, firm silty clay loam
43 to 53 inches—light brownish gray, mottled, friable silty clay loam
53 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Virden soils in the slightly lower landscape positions that are subject to ponding
• The poorly drained Piasa soils, which have a high content of sodium in the subsoil; in the slightly lower landscape positions that are subject to ponding
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Herrick soil
• Soils that have slopes of more than 2 percent

Similar soils:
• Soils that have less clay in the subsoil
• Soils that are lighter colored throughout
• Soils that have a lighter colored subsurface layer

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, minimize surface compaction, and increase the rate of water infiltration.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIw

48—Ebbert silt loam

Composition

Ebbert and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Brief periods during the spring
Size of areas: 3 to 25 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: Very high
Seasonal high water table: 1 foot above to 2 feet below the surface
Organic matter content: 2 to 3 percent
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 7 inches—very dark grayish brown, friable silt loam

Subsurface layer:
7 to 12 inches—very dark gray, friable silt loam
12 to 22 inches—dark gray, mottled, friable silt loam

Subsoil:
22 to 29 inches—dark gray, mottled, friable silty clay loam
29 to 37 inches—gray, mottled, friable silty clay loam
37 to 50 inches—grayish brown, mottled, friable silty clay loam
50 to 60 inches—grayish brown, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
- The somewhat poorly drained Oconee soils in the slightly higher positions on the landscape
- The poorly drained Piasa soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Ebbert soil

Similar soils:
- Soils that have more clay in the subsoil
- Soils that have a thinner dark surface soil
- Soils that have more than 4 percent organic matter in the surface layer

Use and Management

Cropland

Suitability: Moderately suited

Management considerations:
- Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
- Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
- Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
- Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Generally unsuited because of the ponding

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding and the slow permeability

Interpretive Groups

Land capability classification: IIIw

50—Virden silt loam

Composition

Virden and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Brief periods during the spring
Size of areas: 3 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: High
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Organic matter content: 4 to 6 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 8 inches—very dark gray, friable silt loam

Subsurface layer:
8 to 14 inches—black, friable silty clay loam

Subsoil:
14 to 22 inches—very dark gray, mottled, firm silty clay loam
22 to 33 inches—dark grayish brown, mottled, firm silty clay
33 to 54 inches—grayish brown, mottled, firm silty clay loam
54 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Herrick soils in the slightly higher positions on the landscape
• The poorly drained Piasa soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Virden soil

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have a lighter colored subsurface layer
• Soils that have a dark surface soil more than 24 inches thick
• Soils that have less than 4 percent organic matter in the surface layer

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Generally unsuited because of the ponding and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding and the moderately slow permeability

Interpretive Groups

Land capability classification: IIw

84—Okaw silt loam

Composition

Okaw and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Stream terraces
Position on the landform: Treads
Shape of areas: Irregular
Ponding: Brief periods during the spring
Size of areas: 5 to 100 acres
Major uses: Cropland and woodland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Lacustrine sediments or alluvium with a thin mantle of loess
Runoff: Very slow or ponded
Available water capacity: High
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 4 inches—dark grayish brown, friable silt loam

Subsurface layer:
4 to 10 inches—grayish brown, mottled, friable silt loam

Subsoil:
10 to 23 inches—grayish brown, mottled, friable silty clay loam
23 to 54 inches—dark gray, mottled, firm silty clay
54 to 60 inches—grayish brown, mottled, firm silty clay

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Hurst soils in the slightly higher landscape positions on the landscape

Similar soils:
• Soils that have a darker and thicker surface soil
• Soils that have less clay in the subsoil
• Soils that have more clay in the surface soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.
• Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the ponding and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding and the very slow permeability

Interpretive Groups

Land capability classification: IIIw

112—Cowden silt loam

Composition

Cowden and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Very slow
Available water capacity: High
Seasonal high water table: At the surface to 2 feet below the surface
Organic matter content: 2 to 3 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 9 inches—very dark gray, friable silt loam

Subsurface layer:
9 to 16 inches—grayish brown, mottled, friable silt loam

Subsoil:
16 to 31 inches—dark grayish brown, mottled, firm silty clay loam
31 to 38 inches—grayish brown, mottled, firm silty clay loam
38 to 50 inches—olive gray, mottled, friable silty clay loam

Substratum:
50 to 60 inches—gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Piasa soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Cowden soil
• The poorly drained Huey soils, which have a lighter colored surface layer than the Cowden soil and have a high content of sodium in the subsoil; in landscape positions similar to those of the Cowden soil

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have a thicker dark surface soil
• Soils that have a lighter colored surface layer
• Soils in which the seasonal high water table is at a depth of more than 2 feet

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Generally unsuited because of the wetness and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the wetness and the slow permeability

Interpretive Groups

Land capability classification: IIw

113A—Oconee silt loam, 0 to 2 percent slopes

Composition

Oconee and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 3 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 2 to 3 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 9 inches—very dark grayish brown, friable silt loam

Subsurface layer:
9 to 15 inches—dark grayish brown, friable silt loam
15 to 19 inches—grayish brown, mottled, friable silt loam

Subsoil:
19 to 26 inches—brown, mottled, firm silty clay loam
26 to 43 inches—grayish brown, mottled, firm silty clay loam

Substratum:
43 to 60 inches—gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Oconee soil
• Soils that have a seasonal high water table ponded on the surface
• Soils that have slopes of more than 2 percent

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have a lighter colored surface layer
• Soils that have a thicker dark surface soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, minimize surface compaction, and increase the rate of water infiltration.

• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of this soil.

Interpretive Groups

Land capability classification: IIw

113B—Oconee silt loam, 2 to 5 percent slopes

Composition

Oconee and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Crests, interfluves, side slopes, and head slopes
Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 2 to 3 percent
Erosion hazard: Moderate
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 19 inches—dark grayish brown, mottled, friable silt loam

Subsoil:
19 to 28 inches—brown, mottled, firm silty clay loam
28 to 37 inches—grayish brown, mottled, firm silty clay loam
37 to 46 inches—grayish brown, mottled, friable silty clay loam
46 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Oconee soil
• Soils that have slopes of less than 2 percent

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have a lighter colored surface layer
• Soils that are moderately eroded

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Maintaining surface ditches helps to remove excess water.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to

prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily in areas of this soil if the site is leveled.

Interpretive Groups

Land capability classification: IIe

120—Huey silt loam

Composition

Huey and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Brief periods during the spring
Size of areas: 3 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess or loess and the underlying silty and loamy sediments
Runoff: Very slow or ponded
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Organic matter content: 1 to 2 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 8 inches—dark gray, friable silt loam

Subsurface layer:
8 to 14 inches—dark grayish brown, friable silt loam

Subsoil:
14 to 30 inches—dark grayish brown, mottled, friable silty clay loam
30 to 43 inches—grayish brown, mottled, friable silty clay loam
43 to 52 inches—light brownish gray, mottled, friable silty clay loam
52 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils in the slightly higher landscape positions that are not subject to ponding
• The poorly drained Rushville and Wynoose soils, which do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Huey soil

Similar soils:
• Soils that have more clay in the subsoil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• The high content of sodium in the subsoil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Generally unsuited because of the ponding

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding and the very slow permeability

Interpretive Groups

Land capability classification: IVw

127B—Harrison silt loam, 2 to 5 percent slopes

Composition

Harrison and similar soils: 100 percent

Setting

Landform: Till plains
Position on the landform: Crests
Shape of areas: Irregular or oval
Size of areas: 3 to 150 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: 4 to 6 feet below the surface
Organic matter content: 3 to 4 percent
Erosion hazard: Moderate
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 10 inches—very dark gray, friable silt loam

Subsurface layer:
10 to 16 inches—very dark grayish brown, friable silt loam

Subsoil:
16 to 23 inches—brown, friable silty clay loam
23 to 48 inches—brown, mottled, friable silty clay loam
48 to 60 inches—brown, mottled, friable silt loam

Inclusions

Similar soils:
• Soils that have slopes of less than 2 percent
• Soils that have a moderately eroded surface soil
• Soils that are lighter colored
• Soils in which the seasonal high water table is at a depth of more than 6 feet
• Soils that have slopes of more than 5 percent

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces (fig. 11), or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Moderately suited
Management considerations:
• Subsurface tile drains help to lower the seasonal high water table.

Interpretive Groups

Land capability classification: IIe

164A—Stoy silt loam, 0 to 2 percent slopes

Composition

Stoy and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 2 percent
Shrink-swell potential: Moderate

Figure 11.—Tile outlet terraces that have grassed back slopes have been established in this area of Harrison silt loam, 2 to 5 percent slopes. These structures help to control water erosion.

Typical Profile

Surface layer:
0 to 7 inches—dark brown, friable silt loam

Subsurface layer:
7 to 12 inches—brown, friable silt loam

Subsoil:
12 to 22 inches—yellowish brown, mottled, friable silt loam
22 to 27 inches—yellowish brown, mottled, firm silty clay loam
27 to 45 inches—grayish brown, mottled, very firm silty clay loam
45 to 53 inches—yellowish brown, mottled, firm silty clay loam

Substratum:
53 to 60 inches—yellowish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Weir soils in the slightly lower landscape positions that are subject to ponding
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Stoy soil
• Soils that have slopes of more than 2 percent

Similar soils:
• Soils that have more clay in the subsoil

• Soils that have more sand in the lower part of the subsoil and in the substratum

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, minimize surface compaction, and increase the rate of water infiltration.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of this soil.

Interpretive Groups

Land capability classification: IIw

164B—Stoy silt loam, 2 to 5 percent slopes

Composition

Stoy and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Crests and interfluves
Shape of areas: Irregular
Size of areas: 3 to 10 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: Moderate
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 9 inches—dark brown, friable silt loam

Subsurface layer:
9 to 16 inches—yellowish brown, friable silt loam

Subsoil:
16 to 21 inches—yellowish brown, friable silt loam
21 to 37 inches—yellowish brown, mottled, firm silty clay loam
37 to 47 inches—grayish brown, mottled, very firm silt loam

Substratum:
47 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Stoy soil
• Soils that have slopes of less than 2 percent

Similar soils:
• Soils that have more clay in the subsoil
• Soils that are moderately eroded
• Soils that have more sand in the lower part of the subsoil and in the substratum

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.

• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Dwellings

Suitability: Poorly suited
Management considerations:
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily in areas of this soil if the site is leveled.

Interpretive Groups

Land capability classification: IIe

164C2—Stoy silt loam, 5 to 10 percent slopes, eroded

Composition

Stoy and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 3 to 5 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 6 inches—dark brown, friable silt loam

Subsoil:
6 to 31 inches—yellowish brown, mottled, firm silty clay loam
31 to 41 inches—brown, mottled, firm silt loam

Substratum:
41 to 60 inches—brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Stoy soil
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are not eroded
• Soils that have more sand in the lower part of the subsoil and in the substratum

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• Excluding livestock helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIIe

165—Weir silt loam

Composition

Weir and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Brief periods during the spring
Size of areas: 3 to 5 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: High
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Organic matter content: 1 to 2 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 5 inches—grayish brown, mottled, friable silt loam

Subsurface layer:
5 to 14 inches—light brownish gray, mottled, friable silt loam

Subsoil:
14 to 24 inches—grayish brown, mottled, firm silty clay loam
24 to 42 inches—light brownish gray, mottled, firm silty clay loam
42 to 47 inches—light brownish gray, mottled, friable silty clay loam

Substratum:
47 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Marine and Stoy soils in the slightly higher landscape positions that are not subject to ponding
• The poorly drained Huey soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Weir soil

Similar soils:
• Soils that have less clay in the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.

• Planting seedlings that are larger than normal and eliminating competing vegetation reduce the seedling mortality rate.
• Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the ponding and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding and the very slow permeability

Interpretive Groups

Land capability classification: IIIw

214B—Hosmer silt loam, 2 to 5 percent slopes

Composition

Hosmer and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Crests and interfluves
Shape of areas: Irregular
Size of areas: 3 to 10 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: 2.5 to 3.0 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: Moderate
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 7 inches—brown, friable silt loam

Subsurface layer:
7 to 10 inches—yellowish brown, friable silt loam

Subsoil:
10 to 29 inches—yellowish brown, mottled, friable silty clay loam
29 to 36 inches—mottled yellowish brown and grayish brown, firm silty clay loam
36 to 50 inches—mottled yellowish brown and light brownish gray, firm silty clay loam
50 to 60 inches—mottled yellowish brown and light brownish gray, friable silt loam

Inclusions

Contrasting inclusions:
• Soils that have slopes of less than 2 percent
• The well drained Alford and moderately well drained Muren soils, which have moderate permeability throughout the subsoil; in landscape positions similar to those of the Hosmer soil

Similar soils:
• Soils that have more clay in the subsoil
• Soils that are moderately eroded
• Soils that have more sand in the lower part of the subsoil
• Soils in which the seasonal high water table is less than 2.5 feet below the surface

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses

include indiangrass, switchgrass, big bluestem, and little bluestem.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface tile drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIe

214C2—Hosmer silt loam, 5 to 10 percent slopes, eroded

Composition

Hosmer and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes
Shape of areas: Irregular
Size of areas: 3 to 10 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: 2.5 to 3.0 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 5 inches—dark brown, friable silt loam

Subsoil:
5 to 20 inches—yellowish brown, friable silty clay loam
20 to 37 inches—pale brown, friable silty clay loam
37 to 47 inches—pale brown, mottled, very firm silt loam

Substratum:
47 to 60 inches—pale brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Hosmer soil
• The moderately well drained Muren soils, which have moderate permeability throughout the subsoil; in landscape positions similar to those of the Hosmer soil
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are not eroded
• Soils that have more sand in the lower part of the subsoil and in the substratum

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that

leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface tile drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIIe

214C3—Hosmer silt loam, 5 to 10 percent slopes, severely eroded

Composition

Hosmer and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes
Shape of areas: Irregular
Size of areas: 3 to 10 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: 2.5 to 3.0 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 3 inches—dark brown, friable silt loam

Subsoil:
3 to 10 inches—yellowish brown, friable silt loam
10 to 29 inches—yellowish brown, firm silty clay loam
29 to 39 inches—dark yellowish brown, mottled, firm silty clay loam
39 to 44 inches—brown, mottled, friable silt loam

Substratum:
44 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
- The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Hosmer soil
- The moderately well drained Muren soils, which have moderate permeability throughout the subsoil; in landscape positions similar to those of the Hosmer soil
- The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
- Soils that are moderately eroded
- Soils that have more sand in the lower part of the subsoil and in the substratum

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
- A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, and a crop rotation that is dominated by forage crops help to control further water erosion.
- Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Management considerations:
- Establishing pasture and hay crops helps to control water erosion.
- Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
- Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
- The plants should not be grazed or clipped until they are sufficiently established.
- Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
- The competition from undesirable plants can be reduced by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
- Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
- Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
- Installing subsurface tile drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
- Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
- Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IVe

214D—Hosmer silt loam, 10 to 18 percent slopes

Composition

Hosmer and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Side slopes
Shape of areas: Irregular
Size of areas: 3 to 5 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Parent material: Loess
Runoff: Rapid
Available water capacity: High

Seasonal high water table: 2.5 to 3.0 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 5 inches—dark brown, friable silt loam

Subsurface layer:
5 to 11 inches—yellowish brown, friable silt loam

Subsoil:
11 to 35 inches—strong brown, firm silty clay loam
35 to 45 inches—brown, mottled, firm silt loam
45 to 57 inches—brown, mottled, friable silt loam

Substratum:
57 to 60 inches—yellowish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Hosmer soil
• The moderately well drained Wilbur soils on narrow flood plains
• The well drained Hickory soils, which have moderate permeability throughout the subsoil; on back slopes and the more convex side slopes

Similar soils:
• Soils that have a moderately eroded surface soil
• Soils that have slopes of less than 10 percent

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, and a crop rotation that is dominated by forage crops help to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Subsurface drains help to lower the water table.
• Land shaping by cutting and filling helps to overcome the slope.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IVe

214D3—Hosmer silt loam, 10 to 18 percent slopes, severely eroded

Composition

Hosmer and similar soils: 90 to 95 percent

Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Side slopes
Shape of areas: Irregular
Size of areas: 3 to 5 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Parent material: Loess
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 2.5 to 3.0 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 4 inches—dark yellowish brown, friable silt loam

Subsoil:
4 to 30 inches—yellowish brown, friable silt loam
30 to 40 inches—brown, mottled, firm silt loam
40 to 49 inches—brown, mottled, friable silt loam

Substratum:
49 to 60 inches—brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Hosmer soil
• The moderately well drained Wilbur soils on narrow flood plains
• The well drained Hickory soils, which have moderate permeability throughout the subsoil; on back slopes and the more convex side slopes

Similar soils:
• Soils that are moderately eroded
• Soils that have slopes of less than 10 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of erosion

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Subsurface drains help to lower the water table.
• Land shaping by cutting and filling helps to overcome the slope.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.

Interpretive Groups

Land capability classification: VIe

308B2—Alford silt loam, 2 to 5 percent slopes, eroded

Composition

Alford and similar soils: 100 percent

Setting

Landform: Till plains
Position on the landform: Crests and interfluves
Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 1 to 2 percent
Erosion hazard: Moderate
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 8 inches—brown, friable silt loam

Subsoil:
8 to 24 inches—dark yellowish brown, friable silty clay loam
24 to 35 inches—yellowish brown, friable silty clay loam
35 to 54 inches—yellowish brown, friable silt loam
54 to 60 inches—yellowish brown, mottled, friable silt loam

Inclusions

Similar soils:
• Soils that are not eroded
• Soils in which the seasonal high water table is at a depth of less than 6 feet

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Interpretive Groups

Land capability classification: IIe

308C2—Alford silt loam, 5 to 10 percent slopes, eroded

Composition

Alford and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Crests and side slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 5 inches—brown, friable silt loam

Subsoil:
5 to 27 inches—brown, friable silty clay loam
27 to 51 inches—strong brown, friable silt loam
51 to 60 inches—strong brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are not eroded
• Soils in which the seasonal high water table is at a depth of less than 6 feet
• Soils that have slopes of more than 10 percent

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Well suited

Interpretive Groups

Land capability classification: IIIe

338A—Hurst silt loam, 0 to 2 percent slopes

Composition

Hurst and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Stream terraces
Position on the landform: Treads
Shape of areas: Irregular
Size of areas: 10 to 500 acres
Major uses: Cropland and woodland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Very slow

Parent material: Lacustrine sediments or alluvium with a thin mantle of loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 2 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 12 inches—grayish brown, mottled, friable silt loam

Subsoil:
12 to 16 inches—yellowish brown, mottled, friable silty clay loam
16 to 34 inches—light yellowish brown, mottled, firm silty clay
34 to 49 inches—grayish brown, mottled, firm silty clay
49 to 60 inches—grayish brown, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
• The poorly drained Okaw soils in the slightly lower landscape positions that are subject to ponding

Similar soils:
• Soils that have a darker surface soil
• Soils that have less clay in the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, minimize surface compaction, and increase the rate of water infiltration.
• Winter wheat and hay crops are subject to frost heave in some years.

Woodland

Management considerations:
• Planting larger seedlings than normal, eliminating competing vegetation, and mulching reduce the seedling mortality rate.
• Using harvesting methods that do not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of this soil.

Interpretive Groups

Land capability classification: IIIw

432B—Geff silt loam, 2 to 5 percent slopes

Composition

Geff and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Stream terraces
Position on the landform: Treads

Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Loess and the underlying loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 3 percent
Erosion hazard: Moderate
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 12 inches—brown, friable silt loam
12 to 17 inches—light brownish gray, mottled, friable silt loam

Subsoil:
17 to 24 inches—yellowish brown, mottled, firm silty clay loam
24 to 33 inches—yellowish brown, mottled, friable silty clay loam
33 to 60 inches—dark yellowish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The moderately well drained Colp soils, which contain more clay in the subsoil than the Geff soil; in landscape positions similar to those of the Geff soil
• Soils that have slopes of less than 2 percent
• Areas that are subject to rare flooding

Similar soils:
• Soils that have a moderately eroded surface soil
• Soils in which the seasonal high water table is at a depth of more than 3 feet
• Soils that have less sand in the lower part of the subsoil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Dwellings

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains near the foundations helps to overcome the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Subsurface tile drains help to lower the seasonal high water table.

Interpretive Groups

Land capability classification: IIe

453B—Muren silt loam, 2 to 5 percent slopes

Composition

Muren and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Crests and interfluves
Shape of areas: Irregular
Size of areas: 3 to 200 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: 2 to 6 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: Moderate
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 7 inches—dark brown, friable silt loam

Subsurface layer:
7 to 12 inches—brown, friable silt loam

Subsoil:
12 to 29 inches—yellowish brown, mottled, friable silty clay loam
29 to 48 inches—brown, mottled, friable silty clay loam
48 to 54 inches—light brownish gray, mottled, friable silty clay loam

Substratum:
54 to 60 inches—mottled light brownish gray and yellowish brown, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Muren soil
• Soils that have slopes of less than 2 percent

Similar soils:
• Soils that have more clay in the subsoil
• Soils that are moderately eroded
• Soils in which the seasonal high water table is at a depth of less than 2 feet
• Soils that have more sand in the lower part of the subsoil and in the substratum

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil and regularly adding other organic material help to maintain tilth and fertility.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface tile drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Subsurface tile drains help to lower the seasonal high water table.

Interpretive Groups

Land capability classification: IIe

453C2—Muren silt loam, 5 to 10 percent slopes, eroded

Composition

Muren and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Loess

Runoff: Medium
Available water capacity: High
Seasonal high water table: 2 to 6 feet below the surface
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 7 inches—dark brown, friable silt loam

Subsoil:
7 to 37 inches—yellowish brown, mottled, friable silty clay loam
37 to 60 inches—yellowish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Grantfork soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Muren soil
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are not eroded
• Soils that have more sand in the lower part of the subsoil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Installing subsurface tile drains around the foundations lowers the water table. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Subsurface tile drains help to lower the seasonal high water table.

Interpretive Groups

Land capability classification: IIIe

474—Piasa silt loam

Composition

Piasa and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Brief periods during the spring

Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Organic matter content: 2 to 4 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 8 inches—very dark gray, friable silt loam

Subsurface layer:
8 to 11 inches—dark gray, friable silt loam

Subsoil:
11 to 17 inches—dark grayish brown, mottled, firm silty clay loam
17 to 37 inches—grayish brown, mottled, firm silty clay loam
37 to 45 inches—grayish brown, mottled, friable silty clay loam
45 to 55 inches—grayish brown, mottled, friable silt loam

Substratum:
55 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Herrick and Oconee soils, which do not have a high content of sodium in the subsoil; in the slightly higher landscape positions that are not subject to ponding
• The poorly drained Cowden soils, which do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Piasa soil
• The somewhat poorly drained Coulterville and Darmstadt soils in the slightly higher landscape positions that are not subject to ponding

Similar soils:
• Soils that have a lighter colored surface layer
• Soils that have less clay in the subsoil
• Soils that have a thicker dark surface soil

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• The high content of sodium in the subsoil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Generally unsuited because of the ponding and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding and the very slow permeability

Interpretive Groups

Land capability classification: IIIw

517A—Marine silt loam, 0 to 2 percent slopes

Composition

Marine and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 5 to 300 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Slow

Available water capacity: High
Seasonal high water table: 1 to 2 feet below the surface
Organic matter content: 1 to 2 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown, friable silt loam

Subsurface layer:
5 to 14 inches—grayish brown, mottled, friable silt loam

Subsoil:
14 to 21 inches—brown, mottled, firm silty clay loam
21 to 36 inches—brown, mottled, friable silty clay loam
36 to 44 inches—grayish brown, mottled, friable silty clay loam
44 to 60 inches—light gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Rushville soils in the slightly lower landscape positions that are subject to ponding
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Marine soil
• Soils that have slopes of more than 2 percent

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have more sand in the lower part of the subsoil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, minimize surface compaction, and increase the rate of water infiltration.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of this soil.

Interpretive Groups

Land capability classification: IIw

533—Urban land

Composition

Urban land: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Shape of areas: Rectangular
Size of areas: 10 to 25 acres
Major uses: Railroad facilities, industrial plants, and the adjacent parking lots

Inclusions

Contrasting inclusions:
• Areas of cut and fill soil material that contains broken bricks, glass, concrete, crushed rock, and railroad cinders

Interpretive Groups

Land capability classification: None assigned

584C2—Grantfork silt loam, 5 to 10 percent slopes, eroded

Composition

Grantfork and similar soils: 85 to 90 percent

Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loamy sediments and the underlying glacial till
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 2 percent
Exchangeable sodium content in the subsoil: 10 to 14 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 6 inches—brown, friable silt loam

Subsoil:
6 to 17 inches—brown, mottled, friable clay loam
17 to 40 inches—grayish brown, mottled, firm clay loam
40 to 58 inches—light brownish gray, mottled, friable loam
58 to 60 inches—light brownish gray, mottled, friable clay loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Blair soils, which do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Grantfork soil
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are not eroded
• Soils that have a seasonal high water table at a depth of more than 3 feet
• Soils that have slopes of more than 10 percent

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, and a crop rotation that is dominated by forage crops help to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• The high content of sodium in the subsoil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains near the foundations helps to overcome the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IVe

584C3—Grantfork silty clay loam, 5 to 10 percent slopes, severely eroded

Composition

Grantfork and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loamy sediments and the underlying glacial till
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Exchangeable sodium content in the subsoil: 10 to 14 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 4 inches—brown, friable silty clay loam

Subsoil:
4 to 22 inches—brown, mottled, friable silty clay loam
22 to 30 inches—brown, mottled, friable clay loam
30 to 60 inches—light brownish gray, mottled, firm clay loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Blair soils, which do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Grantfork soil
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are moderately eroded
• Soils that have a seasonal high water table at a depth of more than 3 feet
• Soils that have slopes of more than 10 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains near the

foundations helps to overcome the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: VIe

584D2—Grantfork silt loam, 10 to 15 percent slopes, eroded

Composition

Grantfork and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loamy sediments and the underlying glacial till
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 2 percent
Exchangeable sodium content in the subsoil: 10 to 14 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 7 inches—dark yellowish brown, friable silt loam

Subsoil:
7 to 11 inches—dark yellowish brown, mottled, friable silty clay loam
11 to 26 inches—brown, mottled, firm silty clay loam
26 to 45 inches—grayish brown, mottled, friable silty clay loam
45 to 54 inches—light brownish gray, mottled, friable silty clay loam

Substratum:
54 to 60 inches—light brownish gray, mottled, friable loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Blair soils, which do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Grantfork soil
• The well drained Hickory soils, which do not have a high content of sodium in the subsoil; on back slopes and the more convex side slopes
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are not eroded
• Soils that have a seasonal high water table at a depth of more than 3 feet
• Soils that have slopes of more than 15 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to

prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains near the foundations helps to overcome the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: Vle

621B2—Coulterville silt loam, 2 to 5 percent slopes, eroded

Composition

Coulterville and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Crests, side slopes, and head slopes
Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess or loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 5 to 14 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 8 inches—dark brown, friable silt loam

Subsoil:
8 to 13 inches—brown, mottled, firm silty clay
13 to 17 inches—pale brown, mottled, firm silty clay loam
17 to 24 inches—grayish brown, mottled, firm silty clay loam
24 to 33 inches—grayish brown, mottled, friable silt loam

Substratum:
33 to 60 inches—gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The moderately well drained Muren soils, which do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Coulterville soil
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that have more clay in the subsoil
• Soils that are uneroded
• Soils that have slopes of more than 5 percent

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Further water erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces.
• Maintaining surface ditches helps to remove excess water.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• The high content of sodium in the subsoil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily in areas of this soil if the site is leveled.

Interpretive Groups

Land capability classification: IIe

621C3—Coulterville silty clay loam, 5 to 10 percent slopes, severely eroded

Composition

Coulterville and similar soils: 85 to 90 percent
Contrasting inclusions: 10 to 15 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess or loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Exchangeable sodium content in the subsoil: 5 to 14 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 4 inches—brown, firm silty clay loam

Subsoil:
4 to 14 inches—brown, mottled, firm silty clay loam
14 to 26 inches—light brownish gray, mottled, firm silty clay loam
26 to 38 inches—gray, mottled, friable silt loam

Substratum:
38 to 60 inches—gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Blair soils, which do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Coulterville soil
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are moderately eroded

• Soils that have slopes of less than 5 percent
• Soils that have more sand throughout the subsoil
• Soils that have a seasonal high water table at a depth of more than 3 feet

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, and a crop rotation that is dominated by forage crops help to control further water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• The high content of sodium in the subsoil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IVe

801B—Orthents, silty, undulating

Composition

Orthents and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Shape of areas: Irregular or rectangular
Slope: 0 to 5 percent
Size of areas: 3 to 25 acres
Major use: Idle areas or commercial development

Soil Properties and Qualities

Drainage class: Moderately well drained or somewhat poorly drained
Permeability: The movement of air and water through these soils varies with the degree of compaction caused by construction equipment.
Parent material: Cut and fill soil material
Runoff: Slow or medium
Available water capacity: High or moderate
Seasonal high water table: 1.5 to 6.0 feet below the surface
Organic matter content: 0.5 to 1.0 percent

Typical Profile

0 to 30 inches—mixed layers of very dark gray, dark grayish brown, grayish brown, brown, or strong brown silt loam or silty clay loam that is friable or firm
30 to 38 inches—grayish brown, mottled, firm silty clay loam

38 to 51 inches—light brownish gray, mottled, friable silty clay loam
51 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• Areas in which nonsoil material, such as railroad cinders or broken bricks, glass, or concrete, has been incorporated into the soil
• Areas that are frequently flooded

Similar soils:
• Soils in which the seasonal high water table is at a depth of more than 6 feet
• Soils in which the seasonal high water table is at a depth of less than 1.5 feet
• Soils that have slopes of more than 5 percent

Use and Management

Cropland

Suitability: Generally unsuited because of compaction caused by cutting and filling

Wildlife habitat

Management considerations:
• Grasses and legumes can be grown as food and cover for openland wildlife habitat.
• Growing orchardgrass, tall fescue, alfalfa, red clover, indiangrass, switchgrass, big bluestem, and little bluestem along with wild herbaceous plants provides food and cover for openland wildlife.
• Measures that protect the habitat from fire and grazing are needed.

Dwellings

Suitability: Onsite investigation is needed to determine suitability and management measures.

Septic tank absorption fields

Suitability: Onsite investigation is needed to determine suitability and management measures.

Interpretive Groups

Land capability classification: IIe

821C—Morristown silt loam, 3 to 12 percent slopes

Composition

Morristown and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Reconstructed crests, interfluves, and side slopes
Shape of areas: Irregular or rectangular
Size of areas: 100 to 200 acres
Major use: Idle areas or reclaimed pasture

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately slow
Parent material: Reclaimed rock quarry overburden
Runoff: Medium
Available water capacity: Low
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 0.5 to 2.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown, friable silt loam

Substratum:
5 to 11 inches—mixed yellowish brown and dark gray, friable very channery silty clay loam
11 to 44 inches—mixed very dark gray, brownish yellow, and yellowish brown, firm very cobbly silty clay loam
44 to 60 inches—mixed dark gray, dark yellowish brown, and yellowish brown, firm very gravelly silty clay loam

Inclusions

Contrasting inclusions:
• Soils that have not been reclaimed with topsoil and have a surface layer that is cobbly loam, very cobbly loam, or stony loam and rock fragments consisting of limestone, siltstone, or fine grained sandstone

Similar soils:
• Soils that have slopes of more than 12 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion and droughtiness

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa

are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult in areas where reclamation has left the surface layer compacted. A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Wildlife habitat

Management considerations:
• Grasses and legumes can be grown as food and cover for openland wildlife habitat.
• Growing orchardgrass, tall fescue, alfalfa, red clover, indiangrass, switchgrass, big bluestem, and little bluestem along with wild herbaceous plants provides food and cover for openland wildlife.
• Measures that protect the habitat from fire and grazing are needed.

Dwellings

Suitability: Generally unsuited because of unstable fill

Septic tank absorption fields

Suitability: Generally unsuited because of unstable fill and the moderately slow permeability

Interpretive Groups

Land capability classification: IIIs

821G—Morristown channery silt loam, 12 to 60 percent slopes

Composition

Morristown and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Reconstructed interfluves and side slopes
Shape of areas: Irregular or rectangular
Size of areas: 200 to 250 acres
Major use: Idle areas or pasture

Soil Properties and Qualities

Drainage class: Well drained
Permeability: Moderately slow
Parent material: Rock quarry overburden
Runoff: Rapid
Available water capacity: Low
Seasonal high water table: Below a depth of 6 feet
Organic matter content: Less than 0.5 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 4 inches—mixed dark grayish brown and brown, friable channery silt loam

Substratum:
4 to 10 inches—mixed dark yellowish brown, brown, and dark gray, friable cobbly silty clay loam
10 to 60 inches—mixed layers of brown, strong brown, dark yellowish brown, or grayish brown, friable very cobbly silty clay loam

Inclusions

Contrasting inclusions:
• Lower areas that are nearly level and are frequently flooded

Similar soils:
• Soils that have slopes of less than 12 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion, droughtiness, slope, and stoniness

Pasture and hay

Management considerations:
• Pasture renovation is difficult on the steep slopes. The surface stoniness restricts the use of most machinery. Broadcast seeding helps in establishing the forage species that help to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.
• Rotating the placement of salt or feed supplements or cross fencing improves forage utilization and grazing distribution.

Wildlife habitat

Management considerations:
• The idle areas provide habitat for openland wildlife.
• Measures that enhance wildlife habitat include providing a wide diversity of shrub and grass species for the greatest diversity of openland wildlife species, maximizing shrub and brushy edge cover, excluding livestock, retaining brush piles as cover for prey species, and protecting the area from fire.

Dwellings

Suitability: Generally unsuited because of the slope and unstable fill

Septic tank absorption fields

Suitability: Generally unsuited because of the slope, the moderately slow permeability, and unstable fill

Interpretive Groups

Land capability classification: VIIe

850D3—Hickory-Hosmer complex, 10 to 18 percent slopes, severely eroded

Composition

Hickory and similar soils: 55 to 60 percent
Hosmer and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Side slopes
Shape of areas: Irregular
Size of areas: 3 to 10 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Hickory

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Hosmer

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Parent material: Loess
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 2.5 to 3.0 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Hickory

Surface layer:
0 to 8 inches—yellowish brown, friable silty clay loam

Subsoil:
8 to 48 inches—yellowish brown, mottled, firm clay loam
48 to 60 inches—light brownish gray, mottled, firm clay loam

Hosmer

Surface layer:
0 to 6 inches—yellowish brown, friable silty clay loam

Subsoil:
6 to 34 inches—dark yellowish brown, mottled, friable silt loam
34 to 44 inches—yellowish brown, mottled, firm silty clay loam
44 to 60 inches—light yellowish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The well drained Alford and moderately well drained Muren soils on the less sloping narrow interfluves
• The moderately well drained Wilbur soils on narrow flood plains
• The somewhat poorly drained Blair soils on head slopes and on the more concave side slopes

Similar soils:
• Soils that are moderately eroded
• Soils that have slopes of less than 10 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to these soils. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Moderately suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Land shaping by cutting and filling helps to overcome the slope.
• Installing subsurface tile drains around the foundations of dwellings with basements lowers the water table in areas of the Hosmer soil.

Septic tank absorption fields

Suitability: Hickory—moderately suited; Hosmer—poorly suited
Management considerations:
• Enlarging the filter field or replacing the soil with more permeable material helps to overcome the restricted permeability.
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water in areas of the Hosmer soil.
• Installing the filter lines on the contour or land shaping by cutting and filling helps to overcome the slope.

Interpretive Groups

Land capability classification: VIe

880A—Darmstadt-Coulterville complex, 0 to 2 percent slopes

Composition

Darmstadt and similar soils: 50 to 55 percent
Coulterville and similar soils: 40 to 45 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Darmstadt—broad summits; Coulterville—side slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Darmstadt

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Shrink-swell potential: Moderate

Coulterville

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess or loess and the underlying silty and loamy sediments
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 5 to 14 percent
Shrink-swell potential: Moderate

Typical Profile

Darmstadt

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 13 inches—grayish brown, friable silt loam

Subsoil:
13 to 33 inches—brown, mottled, friable silty clay loam
33 to 41 inches—light brownish gray, mottled, friable silty clay loam
41 to 51 inches—light gray, mottled, friable silt loam

Substratum:
51 to 60 inches—light gray, mottled, friable silt loam

Coulterville

Surface layer:
0 to 7 inches—dark grayish brown, friable silt loam

Subsurface layer:
7 to 12 inches—grayish brown, friable silt loam

Subsoil:
12 to 25 inches—brown, mottled, firm silty clay
25 to 33 inches—brown, mottled, friable silty clay loam
33 to 41 inches—grayish brown, mottled, friable silty clay loam
41 to 49 inches—light brownish gray, mottled, friable silt loam

Substratum:
49 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Marine soils, which do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Darmstadt and Coulterville soils
• The somewhat poorly drained Hoyleton and Oconee soils, which have a darker surface layer than the Darmstadt and Coulterville soils and do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Darmstadt and Coulterville soils
• The poorly drained Huey soils in the slightly lower landscape positions that are subject to ponding

Similar soils:
• Soils that have more clay in the subsoil

Use and Management

Cropland

Suitability: Darmstadt—moderately suited; Coulterville—well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• The high content of sodium in the subsoil of these soils reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water infiltration.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains near the foundations helps to overcome the wetness.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of these soils.

Interpretive Groups

Land capability classification: IIIw

880B2—Darmstadt-Coulterville complex, 2 to 5 percent slopes, eroded

Composition

Darmstadt and similar soils: 50 to 55 percent
Coulterville and similar soils: 40 to 45 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Crests, side slopes, and head slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Darmstadt

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess or loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Erosion hazard: High
Shrink-swell potential: Moderate

Coulterville

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess or loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 5 to 14 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Darmstadt

Surface layer:
0 to 5 inches—dark grayish brown, friable silt loam

Subsoil:
5 to 26 inches—brown, mottled, friable silty clay loam
26 to 45 inches—light brownish gray, mottled, friable silt loam

Substratum:
45 to 60 inches—light brownish gray, mottled, friable silt loam

Coulterville

Surface layer:
0 to 6 inches—dark brown, friable silt loam

Subsoil:
6 to 14 inches—brown, mottled, friable silty clay loam
14 to 24 inches—grayish brown, mottled, friable silty clay loam
24 to 32 inches—grayish brown, mottled, friable silt loam
32 to 60 inches—dark grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The moderately well drained Muren and somewhat poorly drained Bluford soils, which do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Darmstadt and Coulterville soils
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that have more clay in the subsoil
• Soils that are uneroded
• Soils that have slopes of more than 5 percent

Use and Management

Cropland

Suitability: Darmstadt—moderately suited; Coulterville—well suited
Management considerations:
• Further water erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces.
• Maintaining surface ditches helps to remove excess water.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• The high content of sodium in the subsoil of these soils reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes

improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to these soils. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• Planting larger seedlings than normal, eliminating competing vegetation, and mulching reduce the seedling mortality rate.
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains near the foundations helps to overcome the wetness.

Septic tank absorption fields

Suitability: Generally unsuited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily in areas of these soils if the site is leveled.

Interpretive Groups

Land capability classification: IIIe

900E—Hickory-Wellston complex, 18 to 30 percent slopes

Composition

Hickory and similar soils: 50 to 55 percent
Wellston and similar soils: 40 to 45 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and back slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major uses: Woodland and pasture

Soil Properties and Qualities

Hickory

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial till with a thin mantle of loess
Runoff: Rapid
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Wellston

Drainage class: Well drained
Permeability: Moderate
Parent material: Loess and glacial drift over residual material weathered from sandstone or siltstone
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Low

Typical Profile

Hickory

Surface layer:
0 to 5 inches—very dark grayish brown, friable silt loam

Subsurface layer:
5 to 9 inches—brown, friable silt loam

Subsoil:
9 to 15 inches—yellowish brown, mottled, friable silt loam
15 to 22 inches—yellowish brown, mottled, friable silty clay loam
22 to 37 inches—yellowish brown, mottled, firm clay loam
37 to 60 inches—yellowish brown, mottled, friable loam

Wellston

Surface layer:
0 to 5 inches—very dark grayish brown, friable silt loam

Subsurface layer:
5 to 9 inches—yellowish brown, friable silt loam

Subsoil:
9 to 27 inches—brownish yellow, friable silt loam
27 to 40 inches—light yellowish brown, mottled, friable silt loam
40 to 47 inches—pale brown, mottled, friable loam

Substratum:
47 to 60 inches—reddish yellow and pale yellow, soft, weathered sandstone that has pockets of pale brown loam in cracks

Inclusions

Contrasting inclusions:
• The moderately well drained Ava and well drained Alford soils on gently sloping narrow interfluves
• The somewhat poorly drained Blair soils on head slopes and on the more concave, less sloping side slopes
• The moderately well drained Wilbur soils on narrow flood plains
• Outcrops of sandstone or siltstone bedrock at the base of slopes

Similar soils:
• Soils that have a moderately eroded surface soil
• Soils that have soft, weathered sandstone or siltstone at a depth of less than 40 inches
• Soils that have slopes of less than 18 percent or more than 30 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion and the slope

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to these soils. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Using a no-till method of pasture renovation or seeding on the contour helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.
• Rotating the placement of salt or feed supplements or cross fencing improves forage utilization and grazing distribution.

Woodland

Management considerations:
• The slope increases the hazard of erosion and limits the use of equipment.
• Placing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, using grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging has been completed help to control erosion.
• The use of machinery is limited to periods when the soil is firm.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Wildlife habitat

Management considerations:
• In wooded areas the dense stands of timber provide good habitat for woodland wildlife.
• Measures that enhance wildlife habitat include providing a wide diversity of tree and shrub species for the greatest diversity of woodland wildlife species, maximizing shrub and brushy edge cover, protecting the understory by excluding livestock, retaining dead trees for cavity nesting, keeping fallen logs and brush piles as cover for prey species, and protecting the area from fire.

Dwellings

Suitability: Generally unsuited because of the slope

Septic tank absorption fields

Suitability: Generally unsuited because of the slope

Interpretive Groups

Land capability classification: VIe

900G—Wellston-Hickory complex, 30 to 60 percent slopes

Composition

Wellston and similar soils: 65 to 70 percent
Hickory and similar soils: 25 to 30 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and back slopes
Shape of areas: Irregular or long and narrow
Size of areas: 5 to 100 acres
Major use: Woodland

Soil Properties and Qualities

Wellston

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial drift over residual material weathered from sandstone or siltstone
Runoff: Very rapid
Available water capacity: Moderate
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Low

Hickory

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial till with a thin mantle of loess
Runoff: Very rapid
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 1 to 2 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Wellston

Surface layer:
0 to 2 inches—dark grayish brown, friable silt loam

Subsurface layer:
2 to 7 inches—brown, friable silt loam

Subsoil:
7 to 11 inches—strong brown, friable silt loam
11 to 39 inches—strong brown, mottled, friable clay loam
39 to 48 inches—strong brown, mottled, firm clay loam

Substratum:
48 to 55 inches—brownish yellow, mottled, soft, weathered sandstone
55 inches—hard sandstone

Hickory

Surface layer:
0 to 4 inches—dark grayish brown, friable silt loam

Subsurface layer:
4 to 9 inches—brown, friable silt loam

Subsoil:
9 to 19 inches—dark yellowish brown, friable silt loam
19 to 39 inches—dark yellowish brown, mottled, firm clay loam
39 to 50 inches—yellowish brown, mottled, friable clay loam
50 to 60 inches—yellowish brown, mottled, friable loam

Inclusions

Contrasting inclusions:
• The moderately well drained Wilbur soils on narrow flood plains
• Outcrops of sandstone or siltstone bedrock at the base of slopes

Similar soils:
• Soils that have a moderately eroded surface soil
• Soils that have soft, weathered sandstone or siltstone at a depth of less than 40 inches
• Soils that have slopes of less than 30 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion and the slope

Woodland

Management considerations:
• The slope increases the hazard of erosion and limits the use of equipment.
• Placing logging roads and skid trails on or nearly on the contour, skidding logs or trees uphill with a cable and winch, using grass firebreaks, and seeding bare areas to grass or to a grass-legume mixture after logging has been completed help to control erosion.
• The use of machinery is limited to periods when the soil is firm.

• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Wildlife habitat

Management considerations:
• The dense stands of timber provide good habitat for woodland wildlife.
• Measures that enhance wildlife habitat include providing a wide diversity of tree and shrub species for the greatest diversity of woodland wildlife species, maximizing shrub and brushy edge cover, protecting the understory by excluding livestock, retaining dead trees for cavity nesting, keeping fallen logs and brush piles as cover for prey species, and protecting the area from fire.

Dwellings

Suitability: Generally unsuited because of the slope

Septic tank absorption fields

Suitability: Generally unsuited because of the slope

Interpretive Groups

Land capability classification: VIIe

909A—Coulterville-Oconee complex, 0 to 2 percent slopes

Composition

Coulterville and similar soils: 50 to 55 percent
Oconee and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 3 to 5 acres
Major use: Cropland

Soil Properties and Qualities

Coulterville

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess or loess and the underlying silty and loamy sediments
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 5 to 14 percent
Shrink-swell potential: Moderate

Oconee

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 2 to 3 percent
Shrink-swell potential: High

Typical Profile

Coulterville

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 14 inches—grayish brown, friable silt loam

Subsoil:
14 to 30 inches—brown, mottled, firm silty clay loam
30 to 47 inches—grayish brown, mottled, firm silty clay loam

Substratum:
47 to 60 inches—light brownish gray, mottled, friable silt loam

Oconee

Surface layer:
0 to 10 inches—very dark grayish brown, friable silt loam

Subsurface layer:
10 to 14 inches—grayish brown, friable silt loam

Subsoil:
14 to 32 inches—dark brown, mottled, firm silty clay loam
32 to 48 inches—grayish brown, mottled, firm silty clay loam
48 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Huey, Piasa, and Rushville soils in the slightly lower landscape positions that are subject to ponding
• Soils that have slopes of more than 2 percent

Similar soils:
• Soils that have a high content of sodium in the subsoil and have more clay in the subsoil than the Coulterville soil
• Soils that do not have a high content of sodium in the subsoil and have less clay in the subsoil than the Oconee soil
• Soils that do not have a high content of sodium in the subsoil and have a lighter colored surface layer than the Oconee soil
• Soils that do not have a high content of sodium in the subsoil and have a thicker dark surface soil than the Oconee soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• The high content of sodium in the subsoil of the Coulterville soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water infiltration.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to reduce the structural damage caused by shrinking and swelling in areas of the Oconee soil.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of these soils.

Interpretive Groups

Land capability classification: IIw

909B—Coulterville-Oconee complex, 2 to 5 percent slopes

Composition

Coulterville and similar soils: 50 to 55 percent
Oconee and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Crests, side slopes, and head slopes
Shape of areas: Irregular
Size of areas: 3 to 25 acres
Major use: Cropland

Soil Properties and Qualities

Coulterville

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess or loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 5 to 14 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Oconee

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Medium

Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 2 to 3 percent
Erosion hazard: Moderate
Shrink-swell potential: High

Typical Profile

Coulterville

Surface layer:
0 to 7 inches—dark grayish brown, very friable silt loam

Subsurface layer:
7 to 10 inches—grayish brown, friable silt loam

Subsoil:
10 to 32 inches—brown, mottled, firm silty clay loam
32 to 40 inches—grayish brown, mottled, firm silty clay loam

Substratum:
40 to 60 inches—light gray, mottled, friable silt loam

Oconee

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 13 inches—grayish brown, friable silt loam

Subsoil:
13 to 30 inches—brown, mottled, firm silty clay loam
30 to 49 inches—grayish brown, mottled, firm silty clay loam

Substratum:
49 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Orion soils on narrow flood plains

Similar soils:
• Soils that are not eroded
• Soils that have slopes of more than 5 percent
• Soils that have a high content of sodium in the subsoil and have more clay in the subsoil than the Coulterville soil
• Soils that do not have a high content of sodium in the subsoil and have less clay in the subsoil than the Oconee soil
• Soils that do not have a high content of sodium in the subsoil and have a lighter colored surface layer than the Oconee soil

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Further water erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces.
• Maintaining surface ditches helps to remove excess water.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• The high content of sodium in the subsoil of the Coulterville soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to these soils. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling in areas of the Oconee soil.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily in areas of these soils if the site is leveled.

Interpretive Groups

Land capability classification: IIe

912A—Darmstadt-Hoyleton complex, 0 to 2 percent slopes

Composition

Darmstadt and similar soils: 50 to 55 percent
Hoyleton and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 10 to 300 acres
Major use: Cropland

Soil Properties and Qualities

Darmstadt

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Shrink-swell potential: Moderate

Hoyleton

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 2 to 3 percent
Shrink-swell potential: High

Typical Profile

Darmstadt

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 13 inches—dark grayish brown, friable silt loam
13 to 18 inches—grayish brown, mottled, friable silt loam

Subsoil:
18 to 25 inches—brown, mottled, firm silty clay loam
25 to 32 inches—brown, mottled, friable silty clay loam
32 to 36 inches—grayish brown, mottled, friable silty clay loam
36 to 42 inches—light brownish gray, mottled, friable silt loam

Substratum:
42 to 56 inches—grayish brown, mottled, friable silt loam
56 to 60 inches—grayish brown, mottled, friable loam

Hoyleton

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 16 inches—grayish brown, friable silt loam

Subsoil:
16 to 24 inches—brown, mottled, firm silty clay loam
24 to 38 inches—grayish brown, mottled, friable silty clay loam
38 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Huey soils in the slightly lower landscape positions that are subject to ponding
• Soils that have a seasonal high water table ponded on the surface and that do not have a high content of sodium in the subsoil
• Soils that have slopes of more than 2 percent

Similar soils:
• Soils that have a high content of sodium in the subsoil and have more clay in the subsoil than the Darmstadt soil
• Soils that do not have a high content of sodium in the subsoil and have a lighter colored surface layer than the Hoyleton soil
• Soils that do not have a high content of sodium in the subsoil and have less clay in the subsoil than the Hoyleton soil
• Soils that do not have a high content of sodium in the subsoil and have less sand in the lower part of the subsoil than the Hoyleton soil

Use and Management

Cropland

Suitability: Darmstadt—moderately suited;
Hoyleton—well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• The high content of sodium in the subsoil of the Darmstadt soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, minimize surface compaction, and increase the rate of water infiltration.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling in areas of the Hoyleton soil.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of these soils.

Interpretive Groups

Land capability classification: IIIw

912B2—Darmstadt-Hoyleton complex, 2 to 5 percent slopes, eroded

Composition

Darmstadt and similar soils: 50 to 55 percent
Hoyleton and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Crests, side slopes, and head slopes
Shape of areas: Irregular
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Darmstadt

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Erosion hazard: High
Shrink-swell potential: Moderate

Hoyleton

Drainage class: Somewhat poorly drained
Permeability: Slow

Parent material: Loess and the underlying silty and loamy sediments
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 2 to 3 percent
Erosion hazard: Moderate
Shrink-swell potential: High

Typical Profile

Darmstadt

Surface layer:
0 to 7 inches—dark brown, friable silt loam

Subsoil:
7 to 13 inches—dark yellowish brown, mottled, firm silty clay loam
13 to 18 inches—brown, mottled, friable silty clay loam
18 to 30 inches—grayish brown, mottled, friable silt loam

Substratum:
30 to 43 inches—grayish brown, mottled, friable silt loam
43 to 60 inches—grayish brown, mottled, friable loam

Hoyleton

Surface layer:
0 to 7 inches—very dark grayish brown, friable silt loam

Subsoil:
7 to 12 inches—yellowish brown, mottled, firm silty clay loam
12 to 16 inches—brown, mottled, firm silty clay loam
16 to 32 inches—light brownish gray, mottled, friable silty clay loam
32 to 60 inches—gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Orion soils on narrow flood plains

Similar soils:
• Soils that are not eroded
• Soils that have slopes of more than 5 percent
• Soils that have a high content of sodium in the subsoil and have more clay in the subsoil than the Darmstadt soil
• Soils that do not have a high content of sodium in the subsoil and have a lighter colored surface layer than the Hoyleton soil
• Soils that do not have a high content of sodium in the subsoil and have less clay in the subsoil than the Hoyleton soil

Use and Management

Cropland

Suitability: Darmstadt—moderately suited; Hoyleton—well suited
Management considerations:
• Further water erosion can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces.
• Maintaining surface ditches helps to remove excess water.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• The high content of sodium in the subsoil of the Darmstadt soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to these soils. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• Planting larger seedlings than normal, eliminating competing vegetation, and mulching reduce the seedling mortality rate.
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to

prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling in areas of the Hoyleton soil.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily in areas of these soils if the site is leveled.

Interpretive Groups

Land capability classification: IIIe

916A—Darmstadt-Oconee complex, 0 to 2 percent slopes

Composition

Darmstadt and similar soils: 50 to 55 percent
Oconee and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Size of areas: 10 to 300 acres
Major use: Cropland (fig. 12)

Soil Properties and Qualities

Darmstadt

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Slow
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Shrink-swell potential: Moderate

Oconee

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 2 to 3 percent
Shrink-swell potential: High

Typical Profile

Darmstadt

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 12 inches—grayish brown, friable silt loam

Subsoil:
12 to 19 inches—brown, mottled, friable silty clay loam
19 to 29 inches—brown, mottled, firm silty clay loam
29 to 38 inches—brown, mottled, friable silty clay loam
38 to 55 inches—light brownish gray, mottled, friable silty clay loam

Substratum:
55 to 60 inches—light brownish gray, mottled, friable silt loam

Oconee

Surface layer:
0 to 8 inches—very dark gray, friable silt loam

Subsurface layer:
8 to 19 inches—dark grayish brown, mottled, friable silt loam

Subsoil:
19 to 24 inches—brown, mottled, firm silty clay loam
24 to 35 inches—grayish brown, mottled, firm silty clay loam
35 to 45 inches—grayish brown, mottled, friable silty clay loam
45 to 57 inches—grayish brown, mottled, friable silt loam

Figure 12.—Double-cropped soybeans and wheat in an area of Darmstadt-Oconee complex, 0 to 2 percent slopes.

Substratum:
57 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
- The poorly drained Huey, Piasa, and Rushville soils in the slightly lower landscape positions that are subject to ponding
- Soils that have slopes of more than 2 percent

Similar soils:
- Soils that have a high content of sodium in the subsoil and have more clay in the subsoil than the Darmstadt soil
- Soils that do not have a high content of sodium in the subsoil and have less clay in the subsoil than the Oconee soil
- Soils that do not have a high content of sodium in the subsoil and have a lighter colored surface layer than the Oconee soil
- Soils that do not have a high content of sodium in the subsoil and have a thicker dark surface soil than the Oconee soil

Use and Management

Cropland

Suitability: Darmstadt—moderately suited; Oconee—well suited
Management considerations:
- Measures that maintain the drainage system are

needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• The high content of sodium in the subsoil of the Darmstadt soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, minimize surface compaction, and increase the rate of water infiltration.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling in areas of the Oconee soil.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of these soils.

Interpretive Groups

Land capability classification: IIIw

916B2—Darmstadt-Oconee complex, 2 to 5 percent slopes, eroded

Composition

Darmstadt and similar soils: 50 to 55 percent
Oconee and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Crests, side slopes, and head slopes
Shape of areas: Irregular
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Darmstadt

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 2.0 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Erosion hazard: High
Shrink-swell potential: Moderate

Oconee

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Medium
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 2 to 3 percent
Erosion hazard: Moderate
Shrink-swell potential: High

Typical Profile

Darmstadt

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsoil:
8 to 19 inches—brown, mottled, friable silty clay loam
19 to 29 inches—light brownish gray, mottled, friable silty clay loam
29 to 32 inches—light gray, mottled, friable silt loam
32 to 45 inches—light brownish gray, mottled, friable silt loam

Substratum:
45 to 60 inches—light brownish gray, mottled, friable silt loam

Oconee

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsoil:
8 to 13 inches—brown, friable silty clay loam
13 to 29 inches—brown, mottled, firm silty clay loam
29 to 37 inches—grayish brown, mottled, friable silty clay loam
37 to 48 inches—grayish brown, mottled, friable silt loam

Substratum:
48 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Orion soils on narrow flood plains

Similar soils:
• Soils that are not eroded
• Soils that have slopes of more than 5 percent
• Soils that have a high content of sodium in the subsoil and have more clay in the subsoil than the Darmstadt soil
• Soils that do not have a high content of sodium in the subsoil and have less clay in the subsoil than the Oconee soil
• Soils that do not have a high content of sodium in the subsoil and have a lighter colored surface layer than the Oconee soil

Use and Management

Cropland

Suitability: Darmstadt—moderately suited; Oconee—well suited
Management considerations:
• Further water erosion (fig. 13) can be controlled by a system of conservation tillage that leaves crop residue on the surface after planting and by contour farming or terraces.
• Maintaining surface ditches helps to remove excess water.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• The high content of sodium in the subsoil of the Darmstadt soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to these soils. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• Planting larger seedlings than normal, eliminating competing vegetation, and mulching reduce the seedling mortality rate.
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling in areas of the Oconee soil.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily if the site is leveled.

Figure 13.—Sheet and rill erosion in an area of Darmstadt-Oconee complex, 2 to 5 percent slopes, eroded.

Interpretive Groups

Land capability classification: IIIe

920—Huey-Rushville complex

Composition

Huey and similar soils: 50 to 55 percent
Rushville and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Brief periods during the spring
Size of areas: 10 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Huey

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: Moderate

Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Organic matter content: 1 to 2 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Shrink-swell potential: Moderate

Rushville

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: High
Seasonal high water table: 1 foot above to 1 foot below the surface
Organic matter content: 1 to 2 percent
Shrink-swell potential: High

Typical Profile

Huey

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 15 inches—grayish brown, friable silt loam

Subsoil:
15 to 23 inches—dark grayish brown, mottled, friable silty clay loam
23 to 30 inches—dark grayish brown, mottled, firm silty clay loam
30 to 55 inches—grayish brown, mottled, firm silty clay loam
55 to 60 inches—light brownish gray, mottled, friable silty clay loam

Rushville

Surface layer:
0 to 8 inches—grayish brown, friable silt loam

Subsurface layer:
8 to 16 inches—light brownish gray, friable silt loam

Subsoil:
16 to 48 inches—light brownish gray, mottled, firm silty clay loam
48 to 57 inches—gray, mottled, friable silty clay loam
57 to 60 inches—light gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville, Darmstadt, and Marine soils in the slightly higher landscape positions that are not subject to ponding

Similar soils:
• Soils that have a high content of sodium in the subsoil and have more clay in the subsoil than the Huey soil
• Soils that do not have a high content of sodium in the subsoil and have less clay in the subsoil than the Rushville soil

Use and Management

Cropland

Suitability: Huey—poorly suited; Rushville—moderately suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• The high content of sodium in the subsoil of the Huey soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting mature stock and planting on ridges reduce the seedling mortality rate.
• Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the ponding

on the Huey and Rushville soils and the high shrink-swell potential of the Rushville soil

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding and the very slow permeability

Interpretive Groups

Land capability classification: IVw

929D3—Hickory-Ava complex, 10 to 18 percent slopes, severely eroded

Composition

Hickory and similar soils: 55 to 60 percent
Ava and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Side slopes
Shape of areas: Irregular
Size of areas: 3 to 10 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Hickory

Drainage class: Well drained
Permeability: Moderate
Parent material: Glacial till
Runoff: Rapid
Available water capacity: High
Seasonal high water table: Below a depth of 6 feet
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Ava

Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Hickory

Surface layer:
0 to 8 inches—brown, firm silty clay loam

Subsoil:
8 to 35 inches—strong brown, mottled, firm clay loam
35 to 60 inches—yellowish brown, mottled, firm clay loam

Ava

Surface layer:
0 to 6 inches—dark yellowish brown, friable silty clay loam

Subsoil:
6 to 32 inches—yellowish brown, mottled, friable silty clay loam
32 to 42 inches—yellowish brown, mottled, firm silty clay loam
42 to 60 inches—grayish brown, mottled, firm clay loam

Inclusions

Contrasting inclusions:
• The moderately well drained Wilbur soils on narrow flood plains
• The somewhat poorly drained Blair soils on head slopes and on the more concave side slopes

Similar soils:
• Soils that are moderately eroded
• Soils that have slopes of less than 10 percent

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
• A system of conservation tillage that leaves crop residue on the surface after planting, terraces, contour farming, and a crop rotation that is dominated by forage crops help to control further water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion. Returning crop residue to the soil and regularly adding other organic material increase the rate of water infiltration and improve tilth.

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to these soils. Suitable warm-season

grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Hickory—moderately suited; Ava—poorly suited
Management considerations:
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Land shaping by cutting and filling helps to overcome the slope.
• Installing subsurface tile drains around the foundations lowers the water table in areas of the Ava soil. The wetness is a more severe limitation on sites for dwellings with basements than on sites for dwellings without basements.

Septic tank absorption fields

Suitability: Hickory—moderately suited; Ava—poorly suited
Management considerations:
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Installing the filter lines on the contour or land shaping by cutting and filling helps to overcome the slope.
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water in areas of the Ava soil.

Interpretive Groups

Land capability classification: IVe

934D3—Blair-Grantfork complex, 7 to 15 percent slopes, severely eroded

Composition

Blair and similar soils: 55 to 60 percent
Grantfork and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Till plains
Position on the landform: Side slopes and head slopes
Shape of areas: Irregular
Size of areas: 3 to 5 acres
Major use: Cropland

Soil Properties and Qualities

Blair

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty and loamy sediments
Runoff: Rapid
Available water capacity: High
Seasonal high water table: 1.5 to 3.5 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Grantfork

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Loamy sediments and the underlying glacial till
Runoff: Rapid
Available water capacity: Moderate
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Exchangeable sodium content in the subsoil: 10 to 14 percent
Erosion hazard: High
Shrink-swell potential: Moderate

Typical Profile

Blair

Surface layer:
0 to 5 inches—dark grayish brown, friable silt loam

Subsoil:
5 to 22 inches—yellowish brown, mottled, firm silty clay loam

22 to 42 inches—grayish brown, mottled, firm silty clay loam
42 to 52 inches—light brownish gray, mottled, firm silty clay loam

Substratum:
52 to 60 inches—light brownish gray, mottled, friable silty clay loam

Grantfork

Surface layer:
0 to 4 inches—dark brown, friable silt loam

Subsoil:
4 to 7 inches—brown, mottled, firm silty clay loam
7 to 34 inches—light brownish gray, mottled, friable silt loam
34 to 54 inches—light gray, mottled, friable loam

Substratum:
54 to 60 inches—light gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The well drained Hickory soils, which do not have a high content of sodium in the subsoil; on back slopes and the more convex side slopes
• The moderately well drained Wilbur soils on narrow flood plains

Similar soils:
• Soils that are moderately eroded
• Soils that have a seasonal high water table at a depth of more than 3.5 feet
• Soils that have slopes of more than 15 percent or less than 7 percent

Use and Management

Cropland

Suitability: Generally unsuited because of the hazard of water erosion

Pasture and hay

Management considerations:
• Establishing pasture and hay crops helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to these soils. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.
• Seedbed preparation is difficult. A no-till method of pasture renovation or seeding helps in establishing forage species and in controlling further erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition and help to prevent surface compaction and excessive runoff.

Woodland

Management considerations:
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains near the foundations helps to overcome the wetness.
• Land shaping by cutting and filling helps to overcome the slope.
• Reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Installing subsurface tile drains higher on the slopes than the absorption field helps to intercept seepage water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: VIe

941—Piasa-Virden complex

Composition

Piasa and similar soils: 50 to 55 percent
Virden and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Brief periods during the spring
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Piasa

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Organic matter content: 2 to 4 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Shrink-swell potential: High

Virden

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: High
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Organic matter content: 4 to 6 percent
Shrink-swell potential: High

Typical Profile

Piasa

Surface layer:
0 to 8 inches—very dark gray, friable silt loam

Subsurface layer:
8 to 12 inches—black, friable silt loam

Subsoil:
12 to 16 inches—black, firm silty clay loam
16 to 39 inches—dark gray, mottled, firm silty clay
39 to 50 inches—olive gray, mottled, firm silty clay loam
50 to 60 inches—grayish brown, mottled, friable silty clay loam

Virden

Surface layer:
0 to 8 inches—very dark gray, friable silt loam

Subsurface layer:
8 to 14 inches—very dark gray, friable silty clay loam

Subsoil:
14 to 21 inches—very dark gray, firm silty clay loam
21 to 29 inches—dark grayish brown, mottled, firm silty clay
29 to 51 inches—grayish brown, mottled, friable silty clay loam
51 to 60 inches—light olive gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville, Darmstadt, Herrick, and Oconee soils in the slightly higher landscape positions that are not subject to ponding

Similar soils:
• Soils that have a dark surface soil more than 24 inches thick
• Soils that do not have a high content of sodium in the subsoil and have a lighter colored subsurface layer than the Virden soil
• Soils that have less clay in the subsoil

Use and Management

Cropland

Suitability: Piasa—moderately suited; Virden—well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• The high content of sodium in the subsoil of the Piasa soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Generally unsuited because of the ponding and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding and the restricted permeability

Interpretive Groups

Land capability classification: IIIw

991—Huey-Cisne complex

Composition

Huey and similar soils: 50 to 55 percent
Cisne and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Huey—brief periods during the spring
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Huey

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Very slow or ponded
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Organic matter content: 1 to 2 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Shrink-swell potential: Moderate

Cisne

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess and the underlying silty and loamy sediments
Runoff: Very slow
Available water capacity: High
Seasonal high water table: At the surface to 2 feet below the surface
Organic matter content: 2 to 3 percent
Shrink-swell potential: High

Typical Profile

Huey

Surface layer:
0 to 8 inches—dark grayish brown, friable silt loam

Subsurface layer:
8 to 11 inches—grayish brown, mottled, friable silt loam

Subsoil:
11 to 20 inches—grayish brown, mottled, friable silty clay loam
20 to 25 inches—grayish brown, mottled, firm silty clay loam
25 to 33 inches—light brownish gray, mottled, friable silty clay loam
33 to 57 inches—light brownish gray, mottled, friable silt loam

Substratum:
57 to 60 inches—light brownish gray, mottled, friable silt loam

Cisne

Surface layer:
0 to 7 inches—very dark grayish brown, friable silt loam

Subsurface layer:
7 to 21 inches—gray, mottled, friable silt loam

Subsoil:
21 to 37 inches—grayish brown, mottled, firm silty clay
37 to 44 inches—light gray, mottled, firm silty clay loam
44 to 60 inches—light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils in the slightly higher landscape positions that are not subject to ponding
• Soils that do not have a high content of sodium in the subsoil and have a seasonal high water table ponded on the surface

Similar soils:
• Soils that have a high content of sodium in the subsoil and have more clay in the subsoil than the Huey soil
• Soils that do not have a high content of sodium in the subsoil and have less clay in the subsoil than the Cisne soil
• Soils that do not have a high content of sodium in the subsoil and have less sand in the lower part of the subsoil than the Cisne soil
• Soils that do not have a high content of sodium in the subsoil and have a lighter colored surface layer than the Cisne soil
• Soils that do not have a high content of sodium in the subsoil and have a seasonal high water table at a depth of more than 2 feet

Use and Management

Cropland

Suitability: Huey—poorly suited; Cisne—moderately suited

Management considerations:

• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.

• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.

• The high content of sodium in the subsoil of the Huey soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.

• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.

• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Generally unsuited because of the ponding in areas of the Huey soil and the wetness and the high shrink-swell potential in areas of the Cisne soil

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding, the wetness, and the restricted permeability

Interpretive Groups

Land capability classification: IVw

993—Piasa-Cowden complex

Composition

Piasa and similar soils: 50 to 55 percent
Cowden and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Piasa—brief periods during the spring
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Piasa

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Organic matter content: Moderately high (2 to 4 percent)
Exchangeable sodium content in the subsoil: 15 percent or more
Shrink-swell potential: High

Cowden

Drainage class: Poorly drained
Permeability: Slow
Parent material: Loess
Runoff: Very slow
Available water capacity: High
Seasonal high water table: At the surface to 2 feet below the surface
Organic matter content: Moderate (2 to 3 percent)
Shrink-swell potential: High

Typical Profile

Piasa

Surface layer:
0 to 8 inches—very dark grayish brown, friable silt loam

Subsurface layer:
8 to 11 inches—dark gray, friable silt loam

Subsoil:
11 to 52 inches—grayish brown, mottled, firm silty clay loam
52 to 60 inches—grayish brown, mottled, friable silty clay loam

Cowden

Surface layer:
0 to 9 inches—very dark gray, friable silt loam

Subsurface layer:
9 to 14 inches—dark grayish brown, friable silt loam
14 to 18 inches—grayish brown, friable silt loam

Subsoil:
18 to 33 inches—grayish brown, mottled, firm silty clay loam
33 to 42 inches—light brownish gray, mottled, friable silty clay loam

42 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils in the slightly higher landscape positions that are not subject to ponding

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have a thicker dark surface soil
• Soils that have a lighter colored surface layer
• Soils that do not have a high content of sodium in the subsoil and have a seasonal high water table at a depth of more than 2 feet

Use and Management

Cropland

Suitability: Piasa—moderately suited; Cowden—well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• The high content of sodium in the subsoil of the Piasa soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Generally unsuited because of the ponding, the wetness, and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding, the wetness, and the restricted permeability

Interpretive Groups

Land capability classification: IIIw

995—Piasa-Herrick complex

Composition

Piasa and similar soils: 50 to 55 percent
Herrick and similar soils: 40 to 45 percent
Contrasting inclusions: 2 to 10 percent

Setting

Landform: Till plains
Position on the landform: Broad summits
Shape of areas: Irregular
Ponding: Piasa—brief periods during the spring
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Piasa

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Loess
Runoff: Very slow or ponded
Available water capacity: Moderate
Seasonal high water table: 0.5 foot above to 2.0 feet below the surface
Organic matter content: 2 to 4 percent
Exchangeable sodium content in the subsoil: 15 percent or more
Shrink-swell potential: High

Herrick

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 3 to 4 percent
Shrink-swell potential: High

Typical Profile

Piasa

Surface layer:
0 to 9 inches—very dark gray, friable silt loam

Subsurface layer:
9 to 14 inches—grayish brown, friable silt loam

Subsoil:
14 to 23 inches—dark grayish brown, mottled, friable silty clay loam

23 to 40 inches—olive gray, mottled, firm silty clay
40 to 60 inches—olive gray, mottled, firm silty clay loam

Herrick

Surface layer:
0 to 9 inches—very dark gray, friable silt loam

Subsurface layer:
9 to 12 inches—very dark grayish brown, friable silt loam

Subsoil:
12 to 18 inches—brown, mottled, friable silty clay loam
18 to 35 inches—grayish brown, mottled, firm silty clay loam
35 to 47 inches—grayish brown, mottled, friable silty clay loam
47 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Coulterville and Darmstadt soils, which have a high content of sodium in the subsoil; in landscape positions similar to those of the Herrick soil and slightly higher than those of the Piasa soil
• The poorly drained Virden soils, which do not have a high content of sodium in the subsoil; in landscape positions similar to those of the Piasa soil and slightly lower than those of the Herrick soil

Similar soils:
• Soils that have less clay in the subsoil
• Soils that have a lighter colored surface soil
• Somewhat poorly drained soils that do not have a high content of sodium in the subsoil and in which the dark part of the surface soil is thinner
• Poorly drained soils that have a high content of sodium in the subsoil and have a thicker dark surface soil

Use and Management

Cropland

Suitability: Piasa—moderately suited; Herrick—well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• The high content of sodium in the subsoil of the Piasa soil reduces the availability of water and the uptake of some plant nutrients and can cause plant stress.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Piasa—generally unsuited because of the ponding and the high shrink-swell potential; Herrick—poorly suited
Management considerations:
• On the Herrick soil, reinforcing footings and foundations helps to prevent the structural damage caused by shrinking and swelling.
• Adding suitable fill material to raise the area above the surrounding ground level, grading, diverting surface water, and installing subsurface tile drains near the foundations help to lower the water table.

Septic tank absorption fields

Suitability: Piasa—generally unsuited because of the ponding and the very slow permeability; Herrick—poorly suited
Management considerations:
• On the Herrick soil, grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIIw

1288—Petrolia silty clay loam, wet

Composition

Petrolia and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Flood plains
Position on the landform: Backswamps
Shape of areas: Irregular
Flooding frequency: Frequent
Flooding duration: Brief
Ponding: Long periods during the winter and spring
Size of areas: 5 to 50 acres
Major use: Woodland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Silty alluvium
Runoff: Very slow or ponded
Available water capacity: High
Seasonal high water table: 0.5 foot above to 3.0 feet below the surface
Organic matter content: 2 to 3 percent
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 4 inches—very dark gray, friable silty clay loam

Subsurface layer:
4 to 9 inches—dark gray, mottled, friable silty clay loam

Substratum:
9 to 50 inches—dark gray, mottled, friable silty clay loam
50 to 60 inches—dark grayish brown, mottled, friable silty clay loam

Inclusions

Contrasting inclusions:
• The moderately well drained Wilbur soils in the slightly higher landscape positions that are not subject to ponding
• Soils that are subject to long periods of flooding

Similar soils:
• Soils that have less clay in the profile
• Soils that have a thicker dark surface soil
• Soils that have more clay in the profile

Use and Management

Cropland

Suitability: Generally unsuited because of the ponding, the flooding, and a lack of adequate drainage

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Wildlife habitat

Management considerations:
• The existing stands of trees provide good habitat for woodland wildlife.
• Measures that enhance wildlife habitat include providing a wide diversity of tree and shrub species for the greatest diversity of woodland wildlife species, maximizing shrub and brushy edge cover, protecting the understory by excluding livestock, retaining dead trees for cavity nesting, keeping fallen logs and brush piles as cover for prey species, and protecting the area from fire.
• Wetland plants and shallow water areas, which enhance wetland wildlife habitat, can be easily established and maintained.
• Maintaining seed-bearing water-tolerant plants provides food for wildlife.

Dwellings

Suitability: Generally unsuited because of the ponding and the flooding

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding, the flooding, and the moderately slow permeability

Interpretive Groups

Land capability classification: Vw

1334—Birds silt loam, wet

Composition

Birds and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Flood plains
Shape of areas: Irregular
Flooding frequency: Frequent
Flooding duration: Brief
Ponding: Long periods during the winter and spring
Size of areas: 5 to 300 acres
Major use: Woodland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow

Parent material: Silty alluvium
Runoff: Very slow or ponded
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: Low

Typical Profile

Surface layer:
0 to 6 inches—dark gray, friable silt loam

Substratum:
6 to 22 inches—dark gray, mottled, friable silt loam
22 to 60 inches—gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The moderately well drained Wilbur soils in the slightly higher landscape positions that are not subject to ponding

Similar soils:
• Soils that have more clay in the profile
• Soils that have less clay in the substratum
• Soils that are subject to long periods of flooding
• Soils that are more acid throughout the substratum

Use and Management

Cropland

Suitability: Generally unsuited because of the ponding, the flooding, and a lack of adequate drainage

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.
• Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Wildlife habitat

Management considerations:
• The existing stands of trees provide good habitat for woodland wildlife.
• Measures that enhance wildlife habitat include providing a wide diversity of tree and shrub species for the greatest diversity of woodland wildlife species, maximizing shrub and brushy edge cover, protecting the understory by excluding livestock, retaining dead trees for cavity nesting, keeping fallen logs and brush piles as cover for prey species, and protecting the area from fire.
• Wetland plants and shallow water areas, which enhance wetland wildlife habitat (fig. 14), can be easily established and maintained.
• Maintaining seed-bearing water-tolerant plants provides food for wildlife.

Dwellings

Suitability: Generally unsuited because of the ponding and the flooding

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding, the flooding, and the moderately slow permeability

Interpretive Groups

Land capability classification: Vw

3084—Okaw silty clay loam, frequently flooded

Composition

Okaw and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Flood plains
Shape of areas: Irregular
Flooding frequency: Frequent
Flooding duration: Brief
Ponding: Brief periods during the winter and spring
Size of areas: 25 to 200 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Lacustrine sediments or alluvium with a thin mantle of loess
Runoff: Very slow or ponded

Figure 14.—Wetland wildlife habitat in an area of Birds silt loam, wet.

Available water capacity: High
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 9 inches—dark gray, friable silty clay loam

Subsurface layer:
9 to 16 inches—grayish brown, mottled, friable silty clay loam

Subsoil:
16 to 24 inches—grayish brown, mottled, firm silty clay
24 to 36 inches—dark gray, mottled, very firm clay
36 to 60 inches—dark gray, mottled, firm silty clay

Inclusions

Contrasting inclusions:
• The moderately well drained Wilbur soils in landscape positions closer to stream channels than those of the Okaw soil
• Soils that are subject to long periods of flooding

Similar soils:
- Soils that have a darker surface layer
- Soils that have less clay in the subsoil

Use and Management

Cropland

Suitability: Poorly suited
Management considerations:
- Flooding normally does not interfere with the growing season but may delay planting in some years.
- Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
- Tilling when the soil is wet causes surface cloddiness and compaction and reduces the rate of water infiltration.
- Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and improve tilth.

Woodland

Management considerations:
- The use of equipment is limited to periods when the soil is firm.
- Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.
- Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
- The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
- Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the ponding, the flooding, and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding, the flooding, and the very slow permeability

Interpretive Groups

Land capability classification: IVw

3108—Bonnie silt loam, frequently flooded

Composition

Bonnie and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Flood plains
Shape of areas: Irregular or long and narrow
Flooding frequency: Frequent
Flooding duration: Brief
Ponding: Brief periods during the winter and spring
Size of areas: 3 to 50 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Silty alluvium
Runoff: Very slow or ponded
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: Low

Typical Profile

Surface layer:
0 to 6 inches—grayish brown, mottled, friable silt loam

Substratum:
6 to 19 inches—stratified light brownish gray and grayish brown, mottled, friable silt loam
19 to 26 inches—stratified light brownish gray silt loam and light gray silt; mottled and friable
26 to 60 inches—stratified light brownish gray silty clay loam and light gray silt; mottled and friable

Inclusions

Contrasting inclusions:
- The somewhat poorly drained Belknap soils in the slightly higher landscape positions that are not subject to ponding

Similar soils:
- Soils that have more clay in the profile
- Soils that have less clay in the substratum

• Soils that are less acid throughout the substratum

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Flooding normally does not interfere with the growing season but may delay planting in some years.
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Avoiding fall tillage and establishing grass strips in critical areas help to control scouring and erosion during floods.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control erosion or scouring during floods.
• Proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture in good condition.
• Reed canarygrass, tall fescue, ladino clover, and alsike clover are suited to this soil. Suitable warm-season grasses include big bluestem, indiangrass, and switchgrass.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.
• Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• The competition from undesirable plants can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the ponding and the flooding

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding, the flooding, and the moderately slow permeability

Interpretive Groups

Land capability classification: IIIw

3288—Petrolia silty clay loam, frequently flooded

Composition

Petrolia and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Flood plains
Shape of areas: Irregular
Flooding frequency: Frequent
Flooding duration: Brief
Ponding: Brief periods during the winter and spring
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Silty alluvium
Runoff: Very slow or ponded
Available water capacity: High
Seasonal high water table: 0.5 foot above to 3.0 feet below the surface
Organic matter content: 2 to 3 percent
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 4 inches—very dark gray, friable silty clay loam

Subsurface layer:
4 to 9 inches—dark gray, mottled, friable silty clay loam

Substratum:
9 to 50 inches—dark gray, mottled, friable silty clay loam
50 to 60 inches—dark grayish brown, mottled, friable silty clay loam

Inclusions

Contrasting inclusions:
• The moderately well drained Wilbur soils in the slightly higher landscape positions that are not subject to ponding
• Soils that are subject to long periods of flooding

Similar soils:
• Soils that have less clay in the profile
• Soils that have a thicker dark surface soil
• Soils that have more clay in the profile

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Flooding normally does not interfere with the growing season but may delay planting in some years.
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface cloddiness and compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and improve tilth.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the ponding and the flooding

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding, the flooding, and the moderately slow permeability

Interpretive Groups

Land capability classification: IIIw

3333—Wakeland silt loam, frequently flooded

Composition

Wakeland and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Flood plains
Shape of areas: Irregular or long and narrow
Flooding frequency: Frequent
Flooding duration: Brief
Size of areas: 25 to 500 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: Low

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown, friable silt loam

Substratum:
7 to 24 inches—grayish brown, mottled, friable silt loam
24 to 48 inches—light brownish gray, mottled, friable silt loam
48 to 60 inches—grayish brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Birds soils in the slightly lower

landscape positions that are subject to ponding
- Soils that are subject to long periods of flooding

Similar soils:
- Soils that have more sand in the profile
- Soils that have a seasonal high water table at a depth of more than 3 feet
- Soils that have a dark buried soil within a depth of 40 inches
- Soils that are more acid throughout the substratum

Use and Management

Cropland

Suitability: Well suited
Management considerations:
- Flooding normally does not interfere with the growing season but may delay planting in some years.
- Avoiding fall tillage and establishing grass strips in critical areas help to control scouring and erosion during floods.
- Wetness can be reduced by surface ditches.
- Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
- Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Management considerations:
- Maintaining a cover of grasses and legumes improves tilth and helps to control erosion or scouring during floods.
- Proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture in good condition.
- Orchardgrass and tall fescue are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.

Woodland

Management considerations:
- The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
- Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
- Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the flooding and the wetness

Septic tank absorption fields

Suitability: Generally unsuited because of the flooding and the wetness

Interpretive Groups

Land capability classification: IIw

3334—Birds silt loam, frequently flooded

Composition

Birds and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Flood plains
Shape of areas: Irregular or long and narrow
Flooding frequency: Frequent
Flooding duration: Brief
Ponding: Brief periods during the winter and spring
Size of areas: 5 to 200 acres
Major uses: Cropland and pasture

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Moderately slow
Parent material: Silty alluvium
Runoff: Very slow or ponded
Available water capacity: Very high
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: Low

Typical Profile

Surface layer:
0 to 9 inches—dark grayish brown, mottled, friable silt loam

Substratum:
9 to 32 inches—gray, mottled, friable silt loam
32 to 45 inches—light gray, mottled, friable silt loam
45 to 60 inches—gray, mottled, friable, stratified silty clay loam and silt loam

Inclusions

Contrasting inclusions:
The moderately well drained Wilbur soils in the

slightly higher landscape positions that are not subject to ponding
• Soils that are subject to long periods of flooding

Similar soils:
• Soils that have more clay in the profile
• Soils that have less clay in the substratum
• Soils that are more acid throughout the substratum

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Flooding normally does not interfere with the growing season (fig. 15) but may delay planting in some years.
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Avoiding fall tillage and establishing grass strips in critical areas help to control scouring and erosion during floods.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration. Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control erosion or scouring during floods.
• Proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture in good condition.
• Reed canarygrass, tall fescue, ladino clover, and alsike clover are suited to this soil. Suitable warm-season grasses include big bluestem, indiangrass, and switchgrass.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.
• Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the ponding and the flooding

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding, the flooding, and the moderately slow permeability

Interpretive Groups

Land capability classification: IIIw

3336—Wilbur silt loam, frequently flooded

Composition

Wilbur and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Flood plains
Shape of areas: Irregular or long and narrow
Flooding frequency: Frequent
Flooding duration: Brief
Size of areas: 25 to 500 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1.5 to 3.0 feet below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: Low

Figure 15.—Early spring flooding in an area of Birds silt loam, frequently flooded.

Typical Profile

Surface layer:
0 to 8 inches—dark grayish brown, mottled, friable silt loam

Substratum:
8 to 60 inches—brown, mottled, friable silt loam

Inclusions

Contrasting inclusions:
- The poorly drained Birds soils in the slightly lower landscape positions that are subject to ponding
- Soils that are subject to long periods of flooding

Similar soils:
- Soils that have more sand in the profile
- Soils that have a seasonal high water table at a depth of more than 3 feet
- Soils that have a dark buried soil within a depth of 40 inches
- Soils that are more acid throughout the substratum

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Flooding normally does not interfere with the growing season but may delay planting in some years.
• Avoiding fall tillage and establishing grass strips in critical areas help to control scouring and erosion during floods.
• Wetness can be reduced by surface ditches.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control erosion or scouring during floods.
• Proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture in good condition.
• Orchardgrass and tall fescue are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the flooding and the wetness

Septic tank absorption fields

Suitability: Generally unsuited because of the flooding and the wetness

Interpretive Groups

Land capability classification: IIw

3382—Belknap silt loam, frequently flooded

Composition

Belknap and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Flood plains
Shape of areas: Irregular or long and narrow
Flooding frequency: Frequent
Flooding duration: Brief
Size of areas: 3 to 50 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: Low

Typical Profile

Surface layer:
0 to 9 inches—brown, mottled, friable silt loam

Substratum:
9 to 60 inches—stratified grayish brown, brown, and light brownish gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Bonnie soils in the slightly lower landscape positions that are subject to ponding

Similar soils:
• Soils that have more sand in the profile
• Soils that have a seasonal high water table at a depth of more than 3 feet
• Soils that are less acid throughout the substratum

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Flooding normally does not interfere with the growing season but may delay planting in some years.

• Avoiding fall tillage and establishing grass strips in critical areas help to control scouring and erosion during floods.
• Wetness can be reduced by surface ditches.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control erosion or scouring during floods.
• Proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture in good condition.
• Orchardgrass and tall fescue are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.

Woodland

Management considerations:
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the flooding and the wetness

Septic tank absorption fields

Suitability: Generally unsuited because of the flooding, the wetness, and the moderately slow permeability

Interpretive Groups

Land capability classification: IIw

3415—Orion silt loam, frequently flooded

Composition

Orion and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Flood plains
Shape of areas: Irregular or long and narrow
Flooding frequency: Frequent
Flooding duration: Brief
Size of areas: 10 to 100 acres
Major uses: Cropland, pasture, and woodland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderate
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: Low

Typical Profile

Surface layer:
0 to 7 inches—dark grayish brown, friable silt loam

Substratum:
7 to 21 inches—grayish brown and brown, mottled, friable silt loam
21 to 40 inches—very dark gray, friable silt loam
40 to 60 inches—very dark gray, mottled, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Birds soils in the slightly lower landscape positions that are subject to ponding
• Soils that are subject to long periods of flooding

Similar soils:
• Soils that have a dark buried soil at a depth of more than 40 inches
• Soils that have a thicker and darker surface soil
• Soils that have more sand in the surface layer and the upper part of the substratum
• Soils that have a seasonal high water table at a depth of more than 3 feet

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Flooding normally does not interfere with the growing season but may delay planting in some years.

• Avoiding fall tillage and establishing grass strips in critical areas help to control scouring and erosion during floods.
• Wetness can be reduced by surface ditches.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control erosion or scouring during floods.
• Proper stocking rates, applications of fertilizer, and restricted use during wet periods help to keep the pasture in good condition.
• Orchardgrass and tall fescue are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm and dry.
• The competition from undesirable vegetation in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the flooding and the wetness

Septic tank absorption fields

Suitability: Generally unsuited because of the flooding and the wetness

Interpretive Groups

Land capability classification: IIIw

3787—Banlic silt loam, frequently flooded

Composition

Banlic and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Flood plains
Shape of areas: Irregular
Flooding frequency: Frequent
Flooding duration: Brief
Size of areas: 3 to 5 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Slow
Parent material: Silty alluvium
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Shrink-swell potential: Low

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown, friable silt loam

Subsurface layer:
5 to 13 inches—brown, mottled, friable silt loam

Subsoil:
13 to 21 inches—pale brown, mottled, friable silt loam
21 to 38 inches—brown, mottled, firm silt loam
38 to 55 inches—light brownish gray, mottled, friable silt loam

Substratum:
55 to 60 inches—mottled light brownish gray and yellowish brown, friable silt loam

Inclusions

Contrasting inclusions:
• The poorly drained Bonnie soils in the slightly lower landscape positions that are subject to ponding

Similar soils:
• Soils that have more sand in the profile
• Soils that have a seasonal high water table at a depth of more than 3 feet

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Flooding normally does not interfere with the growing season but may delay planting in some years.
• Avoiding fall tillage and establishing grass strips in

critical areas help to control scouring and erosion during floods.
• Wetness can be reduced by surface ditches.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Minimizing tillage and returning crop residue to the soil help to maintain good tilth and increase the rate of water infiltration.

Dwellings

Suitability: Generally unsuited because of the flooding and the wetness

Septic tank absorption fields

Suitability: Generally unsuited because of the flooding, the wetness, and the slow permeability

Interpretive Groups

Land capability classification: IIw

7084—Okaw silt loam, rarely flooded

Composition

Okaw and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Stream terraces
Position on the landform: Treads
Shape of areas: Irregular
Flooding frequency: Rare
Ponding: Brief periods during the spring
Size of areas: 5 to 100 acres
Major uses: Cropland and woodland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Very slow
Parent material: Lacustrine sediments or alluvium with a thin mantle of loess
Runoff: Very slow or ponded
Available water capacity: High
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 6 inches—dark grayish brown, friable silt loam

Subsurface layer:
6 to 15 inches—grayish brown, mottled, friable silt loam

Subsoil:
15 to 23 inches—light brownish gray, mottled, firm silty clay loam
23 to 42 inches—light brownish gray, mottled, very firm silty clay
42 to 60 inches—light brownish gray, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Hurst soils in the slightly higher landscape positions that are not subject to ponding
• Soils in the slightly higher landscape positions that are not subject to flooding

Similar soils:
• Soils that have a darker and thicker surface soil
• Soils that have less clay in the subsoil
• Soils that have more clay in the surface soil
• Soils that are subject to occasional flooding

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.
• Winter wheat and hay crops are subject to frost heave in some years.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.
• Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet

wide along the western and southern edges of the woodland reduce the windthrow hazard.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the ponding, the flooding, and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding and the very slow permeability

Interpretive Groups

Land capability classification: IIIw

7122B—Colp silty clay loam, 2 to 5 percent slopes, eroded, rarely flooded

Composition

Colp and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Stream terraces
Position on the landform: Breaks
Shape of areas: Long and narrow or irregular
Flooding frequency: Rare
Size of areas: 3 to 100 acres
Major uses: Cropland and woodland

Soil Properties and Qualities

Drainage class: Moderately well drained
Permeability: Slow
Parent material: Lacustrine sediments or alluvium with a thin mantle of loess
Runoff: Medium
Available water capacity: Moderate
Seasonal high water table: 2 to 4 feet below the surface
Organic matter content: 0.5 to 1.0 percent
Erosion hazard: High
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown, friable silty clay loam

Subsoil:
5 to 10 inches—brown, firm silty clay loam
10 to 27 inches—yellowish brown, mottled, firm silty clay loam
27 to 51 inches—brown, mottled, firm silty clay
51 to 60 inches—grayish brown, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained, moderately permeable Geff soils, which have less clay in the subsoil than the Colp soil; in landscape positions similar to those of the Colp soil
• Soils in the slightly higher landscape positions that are not subject to flooding

Similar soils:
• Soils that are not eroded
• Soils that have a seasonal high water table at a depth of less than 2 feet
• Soils that have slopes of more than 7 percent
• Soils that are subject to occasional flooding

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• A crop rotation that includes 1 or more years of forage crops, a conservation tillage system that leaves crop residue on the surface after planting, terraces, or contour farming helps to control water erosion.
• Tilling when the soil is wet causes surface cloddiness and compaction and excessive runoff and erosion.
• Returning crop residue to the soil and regularly adding other organic material help to maintain productivity and tilth.

Pasture and hay

Management considerations:
• Maintaining a cover of grasses and legumes improves tilth and helps to control water erosion.
• Orchardgrass, tall fescue, red clover, and alfalfa are suited to this soil. Suitable warm-season grasses include indiangrass, switchgrass, big bluestem, and little bluestem.

• A no-till method of seeding or pasture renovation helps in establishing forage species and in controlling erosion.
• The plants should not be grazed or clipped until they are sufficiently established.
• Proper stocking rates, rotation grazing, deferred grazing, and applications of fertilizer help to keep the pasture in good condition.

Woodland

Management considerations:
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the flooding, the wetness, and the high shrink-swell potential

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function satisfactorily in areas of this soil if the site is leveled.

Interpretive Groups

Land capability classification: IIIe

7337A—Creal silt loam, 0 to 2 percent slopes, rarely flooded

Composition

Creal and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Flood plains
Shape of areas: Irregular
Flooding frequency: Rare
Size of areas: 5 to 50 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Parent material: Loess and silty local alluvium
Runoff: Slow
Available water capacity: Very high
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 3 percent
Shrink-swell potential: Moderate

Typical Profile

Surface layer:
0 to 5 inches—brown, friable silt loam

Subsurface layer:
5 to 14 inches—dark grayish brown, mottled, friable silt loam
14 to 25 inches—brown, mottled, friable silt loam
25 to 31 inches—dark grayish brown, mottled, friable silt loam

Subsoil:
31 to 37 inches—dark yellowish brown, mottled, firm silty clay loam
37 to 42 inches—brown, mottled, firm silty clay loam
42 to 60 inches—gray, mottled, friable silty clay loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained, very slowly permeable Hurst soils, which have more clay in the subsoil than the Creal soil; in landscape positions similar to those of the Creal soil
• The poorly drained Racoon soils in the slightly lower landscape positions that are subject to ponding
• Soils that have slopes of more than 2 percent

Similar soils:
• Soils that have a surface soil less than 24 inches thick

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface ditches or subsurface drains function satisfactorily if suitable outlets are available.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, help to prevent surface compaction, and increase the rate of water infiltration.

• Winter wheat and hay crops are subject to frost heave in some years.

Dwellings

Suitability: Generally unsuited because of the wetness and the flooding

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.

Interpretive Groups

Land capability classification: IIw

7338A—Hurst silt loam, 0 to 2 percent slopes, rarely flooded

Composition

Hurst and similar soils: 90 to 95 percent
Contrasting inclusions: 5 to 10 percent

Setting

Landform: Flood plains
Shape of areas: Irregular
Flooding frequency: Rare
Size of areas: 10 to 500 acres
Major uses: Cropland and woodland

Soil Properties and Qualities

Drainage class: Somewhat poorly drained
Permeability: Very slow
Parent material: Lacustrine sediments or alluvium with a thin mantle of loess
Runoff: Slow
Available water capacity: High
Seasonal high water table: 1 to 3 feet below the surface
Organic matter content: 1 to 2 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 5 inches—dark grayish brown, friable silt loam

Subsurface layer:
5 to 10 inches—dark grayish brown, friable silt loam

Subsoil:
10 to 14 inches—brown, mottled, friable silty clay loam
14 to 23 inches—brown, mottled, very firm silty clay
23 to 41 inches—grayish brown, mottled, firm silty clay loam
41 to 60 inches—light brownish gray, mottled, friable silty clay loam

Inclusions

Contrasting inclusions:
• The poorly drained Okaw soils in the slightly lower landscape positions that are subject to ponding
• Soils in the slightly higher landscape positions that are not subject to flooding

Similar soils:
• Soils that have a darker surface soil
• Soils that have less clay in the subsoil
• Soils that are subject to occasional flooding

Use and Management

Cropland

Suitability: Moderately suited
Management considerations:
• Measures that maintain the drainage system are needed. Additional drainage may be needed in some areas. Surface drains function satisfactorily if suitable outlets are available.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Applying a conservation tillage system that leaves crop residue on the surface after planting and returning crop residue to the soil improve tilth, minimize surface compaction, and increase the rate of water infiltration.
• Winter wheat and hay crops are subject to frost heave in some years.

Woodland

Management considerations:
• Planting larger seedlings than normal, eliminating competing vegetation, and mulching reduce the seedling mortality rate.
• Using harvesting methods that do not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.

• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the wetness, the flooding, and the high shrink-swell potential

Septic tank absorption fields

Suitability: Poorly suited
Management considerations:
• Grading and land shaping help to remove excess surface water.
• Enlarging the filter field and installing a sealed sand filter and a disinfection tank or an evapotranspiration bed help to overcome the restricted permeability.
• Sewage lagoons can function well in areas of this soil.

Interpretive Groups

Land capability classification: IIIw

8109—Racoon silt loam, occasionally flooded

Composition

Racoon and similar soils: 95 to 98 percent
Contrasting inclusions: 2 to 5 percent

Setting

Landform: Flood plains
Shape of areas: Irregular or elongated
Flooding frequency: Occasional
Flooding duration: Brief
Ponding: Brief periods during the winter and spring
Size of areas: 5 to 100 acres
Major use: Cropland

Soil Properties and Qualities

Drainage class: Poorly drained
Permeability: Slow
Parent material: Loess and silty alluvium
Runoff: Very slow or ponded
Available water capacity: High
Seasonal high water table: 0.5 foot above to 1.0 foot below the surface
Organic matter content: 1 to 2 percent
Shrink-swell potential: High

Typical Profile

Surface layer:
0 to 9 inches—dark grayish brown, friable silt loam

Subsurface layer:
9 to 17 inches—grayish brown, mottled, friable silt loam
17 to 34 inches—gray, mottled, friable silt loam

Subsoil:
34 to 41 inches—light brownish gray, mottled, firm silty clay loam
41 to 48 inches—light brownish gray, mottled, friable silty clay loam
48 to 54 inches—light gray, mottled, friable silty clay loam

Substratum:
54 to 60 inches—gray, mottled, firm silty clay loam

Inclusions

Contrasting inclusions:
• The somewhat poorly drained Creal soils in the slightly higher landscape positions that are not subject to ponding
• Soils that are subject to long periods of flooding

Similar soils:
• Soils that have more clay in the subsoil
• Soils that have a darker surface soil
• Soils that have a surface layer of light colored silt loam overwash
• Soils that are subject to rare flooding

Use and Management

Cropland

Suitability: Well suited
Management considerations:
• Flooding normally does not interfere with the growing season but may delay planting in some years.
• Measures that maintain the drainage system are needed. Additional drainage is needed in some areas. A combination of surface ditches and land grading can help to overcome the wetness.
• Tilling when the soil is wet causes surface compaction and reduces the rate of water infiltration.
• Returning crop residue to the soil, adding other organic material, and minimizing tillage increase the rate of water infiltration and help to maintain good tilth.

Woodland

Management considerations:
• The use of equipment is limited to periods when the soil is firm.
• Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate.

• Using a harvesting method that does not leave the remaining trees isolated or widely spaced and removing only high-value trees from a strip 50 feet wide along the western and southern edges of the woodland reduce the windthrow hazard.
• The competition from undesirable plants in openings created by timber harvesting can be reduced by chemical or mechanical means.
• Excluding livestock from the woodland helps to prevent destruction of the leaf mulch and of desirable young trees, compaction of the soil, and damage to tree roots.
• Protection from fire prevents injury to trees and maintains the leaf mulch.

Dwellings

Suitability: Generally unsuited because of the ponding, the flooding, and the high shrink-swell potential

Septic tank absorption fields

Suitability: Generally unsuited because of the ponding, the flooding, and the slow permeability

Interpretive Groups

Land capability classification: IIw

Prime Farmland

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the Nation's short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is the land that is best suited to food, feed, forage, fiber, and oilseed crops. It may be cultivated land, pasture, woodland, or other land, but it is not urban or built-up land or water areas. It either is used for food or fiber crops or is available for those crops. The soil qualities, growing season, and moisture supply are those needed for a well managed soil to produce a sustained high yield of crops in an economic manner. Prime farmland produces the highest yields with minimal expenditure of energy and economic resources, and farming it results in the least damage to the environment.

Prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The level of acidity or alkalinity is acceptable. Prime farmland has few or no rocks and is permeable to water and air. It is not excessively erodible or saturated with water for long periods and is not frequently flooded during the growing season. The slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

About 167,755 acres in Washington County, or about 46 percent of the total acreage, meets the requirements for prime farmland. Associations 1, 2, 3, and 7, which are described under the heading "General Soil Map Units," have the highest percentage of prime farmland. Most of this land is used for soybeans, wheat, corn, or grain sorghum. These crops account for much of the local agricultural income each year.

A recent trend in land use in some parts of the county has been the loss of some prime farmland to industrial and urban uses. The loss of prime farmland to other uses puts pressure on marginal lands, which generally are more erodible, are droughty, and are less productive and cannot be easily cultivated.

The map units in the survey area that are considered prime farmland are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described under the heading "Detailed Soil Map Units."

Some soils that have a seasonal high water table and all soils that are frequently flooded during the growing season qualify as prime farmland only in areas where these limitations have been overcome by drainage measures or flood control. The need for these measures is indicated after the map unit name in table 5. Onsite evaluation is needed to determine whether or not these limitations have been overcome by corrective measures. In Washington County most of the naturally wet soils have been adequately drained.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Natural Resources Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under the heading "Detailed Soil Map Units." Specific information can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

In 1987, a total of 282,301 acres in Washington County was cropland and 16,154 acres was pasture (U.S. Department of Commerce, 1991). Soybeans, wheat, corn, and grain sorghum are the major crops. A high percentage of the acreage in wheat is double cropped with soybeans or, in a few places, with grain sorghum. The soils in the county that are suited to cropland have good potential for continued crop production.

The main management concerns affecting crops, hay, and pasture in the county are water erosion, wetness, ponding, a high sodium content, a limited supply of available soil moisture, and soil tilth and fertility.

Water erosion is a concern on about 41 percent of the acreage used for crops, hay, or pasture in the county. It is a hazard in areas where the slope is more than 2 percent. In areas where slopes are longer, the hazard of erosion is higher because runoff water is concentrated as it proceeds downslope.

Sheet and rill erosion is damaging for three reasons. First, the productivity of most soils is reduced if the surface layer is eroded away and the subsoil is incorporated into the plow layer. Second, severe erosion on sloping soils impairs tilth in the surface soil and reduces the rate of water infiltration. Erosion is especially damaging on soils that have a low or very low content of organic matter. These soils tend to be cloddy if worked when too wet and can form a crust after hard rains. On these soils, preparing a good seedbed is difficult because of cloddiness. If the surface is crusted, the rate of water infiltration is reduced and the runoff rate is increased.

Third, uncontrolled erosion results in the sedimentation of drainage ditches, streams, lakes, rivers, and road ditches. Removing this sediment is costly. Management systems that control erosion help to prevent sedimentation and improve the quality of surface water for municipal and recreational uses and for fish and wildlife.

Measures that help to control water erosion include contour farming and conservation tillage. Farming on the contour slows down runoff to a less erosive velocity by changing the direction of water flow. Conservation tillage systems that leave crop residue on the surface after planting protect the soil from erosion and increase the rate of water infiltration.

Terraces, which reduce the length of slopes, are most effective and can be most efficiently installed in areas where slopes are generally smooth and uniform. On the more sloping soils that have short slopes and irregular topography, a crop rotation that is dominated by forage crops is needed to keep water erosion at tolerable levels.

Grassed waterways help to carry runoff water safely downslope to the nearest creek or watercourse. When established in natural drainageways, grassed waterways filter the runoff and reduce the sediment load that enters streams and ponds. Grassed waterways are commonly used in conjunction with other conservation practices, such as terraces, diversions, drop spillways, block chutes (fig. 16), conservation tillage systems, and contour farming operations. Grassed waterways are most effective in areas where slopes are 2 percent or more.

Further information about measures that control erosion is provided in the Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

A surface drainage system and land grading are needed and are being used in most of the somewhat poorly drained and poorly drained soils in the county that are used for cropland. The design of surface drainage systems depends on the kind of soil. Shallow surface ditches should be protected from silt deposition and ditchbank erosion caused by runoff. Tile drains do not function well in these soils because of restricted permeability.

The available water capacity limits crop and forage production in some of the soils in the county. Unless rainfall is frequent and timely in areas where the soils have many rock fragments, root-restrictive layers, a high sodium content in the subsoil, or a very high clay content in the subsoil, plant stress and wilting may occur during hot and dry periods. Morristown soils, for example, contain many rock fragments and are unable to store the water necessary for good plant growth. Ava soils have a layer in the subsoil that restricts root penetration. Soils that have a high content of sodium in the subsoil, such as Darmstadt and Grantfork soils, have a limited amount of water available for uptake by plant roots. Soils that are clayey, such as Wynoose soils, also have a limited available water capacity because water is held very tightly on the clay particles.

The effects of a lower availability of moisture can be minimized by increasing the rate of water infiltration, reducing the amount of runoff, reducing the crop plant population, or planting drought-tolerant crops or crop varieties. Such crops as soybeans and grain sorghum are more drought-tolerant than corn. Winter wheat grows well because it matures in the spring before the moisture stored in the soil is depleted. Some of the more common methods of increasing the rate of water infiltration and reducing the amount of runoff are using a system of reduced tillage, leaving crop residue on the surface, and planting cover crops.

Soil fertility and organic matter content are naturally low in many of the soils in the county. In particular, soils that formed under a vegetation of deciduous forest, such as Ava, Bluford, and Marine soils, are naturally more acid than other soils. On most acid soils, applications of limestone can raise the pH to a level that improves nutrient availability and plant growth. Soils that have a high content of sodium in the subsoil, such as Coulterville, Darmstadt, and Huey soils, have a limited availability and uptake of some plant nutrients. Many crops, particularly corn and wheat, respond well to applications of nitrogen fertilizer. Planting legumes, which take nitrogen from the air and fix it in the soil, and adding livestock manure improve the nitrogen supply and the content of organic matter. Additions of lime, nitrogen, phosphorus, potassium, or any other elements should be based on the results of soil tests. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to be applied.

Soil tilth is an important factor influencing the germination of seeds, the amount of runoff, and the infiltration of water into the soil. A surface soil that is in good tilth is granular and porous. Poor soil tilth is a concern in areas of soils that have a surface layer of silty clay loam, such as the severely eroded Blair and Hickory soils. It is also a concern in areas of poorly drained soils on flood plains that have a surface layer of silty clay loam, such as Petrolia soils. If tilled when wet, these soils tend to become very cloddy.

Figure 16.—This concrete block chute helps to control further erosion in an area of Blair silt loam, 5 to 10 percent slopes, severely eroded.

Preparing a good seedbed for proper seed-to-soil contact is difficult because of the cloddiness. Fall tillage on these soils generally improves soil tilth by allowing freezing and thawing in winter to break down the clods. Leaving crop residue on the surface during fall tillage on sloping soils helps to control erosion and improves soil tilth.

Proper management is needed on pastureland and hayland to prolong the life of desirable forage species, to maintain or improve the quality and quantity of forage, and to control water erosion and reduce the runoff rate (fig. 17). Suitable pasture and hay plants include several legumes, cool-season grasses, and warm-season native grasses. Alfalfa and red clover are the common legumes grown for hay. They can also be used in mixtures with orchardgrass and tall fescue for hay and pasture. Suitable warm-season native grasses include big bluestem, little bluestem, indiangrass, and switchgrass. These grasses grow well in summer. They require different management techniques for establishment and grazing than cool-season grasses.

Alfalfa and red clover are best suited to well drained and moderately well drained soils, such as Alford, Hickory, and Muren soils. The cool-season grasses and warm-season native grasses commonly grown are suited to most of the soils in the county. On poorly drained soils, however, such as Birds

Figure 17.—On the more sloping soils in the county, crop rotations dominated by forage crops help to control runoff and erosion.

soils, plants that are more water-tolerant, such as reed canarygrass, ladino clover, and alsike clover, are better suited and can be included in the forage plant composition.

Good pasture and hayland management includes rotation grazing and proper stocking rates. These practices increase the efficient use of forage and prevent overgrazing and erosion. Other good management measures include renovating pastures that are in poor condition; delaying grazing in the spring until the soil is firm enough to prevent surface compaction and until sufficient plant growth has been reached; deferring grazing or hay cutting in the fall as needed to prevent winterkill and so that the plants can build up carbohydrate reserves for the next year's growth; harvesting when the forage plants are at the proper stage of maturity for maximum quality feed; applying lime and fertilizer according to soil tests and the desired level of production; and controlling competing weeds and brush.

Livestock are less willing to graze in areas where slopes are more than about 20 percent (Vallentine, 1990). In these areas, such as areas of Hickory and Wellston soils, rotating the placement of salt or feed supplements or cross fencing improves forage utilization and grazing distribution.

Yields per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 6. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents (Fehrenbacher and others, 1978). Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 6 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops (USDA, 1961). Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w*, *s*, or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

In 1987, a total of 19,840 acres, or about 6 percent of the total acreage in Washington County, was woodland (U.S. Department of Commerce, 1989). Much of the woodland is in areas that are too steep,

too wet, or too inaccessible for farming. The soils in these areas have fair or good potential for trees of high quality if the best suited species are selected for planting and the woodland is properly managed.

The largest areas of woodland are in associations 4, 5, 6, and 7, which are described under the heading "General Soil Map Units." Common upland tree species are white ash, bitternut hickory, shagbark hickory, black oak, red oak, white oak, and yellow-poplar. Common species on flood plains are green ash, river birch, eastern cottonwood, silver maple, pin oak, sweetgum, and American sycamore.

Harvesting mature trees (fig. 18) and removing nonmerchantable trees that retard the growth of desirable species can improve the commercial value of the woodland. Measures that protect the woodland from fire and from livestock grazing are needed. Disease and insects should be controlled. Tree planting may be necessary unless the stocking is adequate. Control of competing vegetation is needed if seedlings are planted. Planting larger seedlings than normal and eliminating competing vegetation reduce the seedling mortality rate. Seeding grass or grass-legume mixtures between rows of the planted seedlings helps to control erosion. If erosion is excessive or if the slope is more than 15 percent, runoff should be diverted away from haul roads and skid trails. Using harvest methods that do not leave the remaining trees isolated or widely spaced helps to prevent windthrow. Machinery should be used only when the soil is firm enough to support the equipment.

Table 7 can be used by woodland owners or forest managers in planning the use of soils for wood crops. Only those soils suitable for wood crops are listed. The table lists the ordination symbol for each soil. Soils assigned the same ordination symbol require the same general management and have about the same potential productivity.

The first part of the *ordination symbol*, a number, indicates the potential productivity of the soils for an indicator tree species. The number indicates the volume, in cubic meters per hectare per year, which the indicator species can produce. The number 1 indicates low potential productivity; 2 and 3, moderate; 4 and 5, moderately high; 6 to 8, high; 9 to 11, very high; and 12 to 39, extremely high. The second part of the symbol, a letter, indicates the major kind of soil limitation. The letter *R* indicates steep slopes; *X*, stoniness or rockiness; *W*, excessive water in or on the soil; *T*, toxic substances in the soil; *D*, restricted rooting depth; *C*, clay in the upper part of the soil; *S*, sandy texture; *F*, high content of rock fragments in the soil; and *N*, snowpack. The letter *A* indicates that limitations or restrictions are insignificant. If a soil has more than one limitation, the priority is as follows: R, X, W, T, D, C, S, F, and N.

In table 7, *slight, moderate,* and *severe* indicate the degree of the major soil limitations to be considered in management.

Erosion hazard is the probability that damage will occur as a result of site preparation and cutting where the soil is exposed along roads, skid trails, and fire lanes and in log-handling areas. Forests that have been burned or overgrazed are also subject to erosion. Ratings of the erosion hazard are based on the percent of the slope. A rating of *slight* indicates that no particular prevention measures are needed under ordinary conditions. A rating of *moderate* indicates that erosion-control measures are needed in certain silvicultural activities. A rating of *severe* indicates that special precautions are needed to control erosion in most silvicultural activities.

Equipment limitation reflects the characteristics and conditions of the soil that restrict use of the equipment generally needed in woodland management or harvesting. The chief characteristics and conditions considered in the ratings are slope, stones on the surface, rock outcrops, soil wetness, and texture of the surface layer. A rating of *slight* indicates that under normal conditions the kind of equipment and season of use are not significantly restricted by soil factors. Soil wetness can restrict equipment use, but the wet period does not exceed 1 month. A rating of *moderate* indicates that equipment use is moderately restricted because of one or more soil factors. If the soil is wet, the wetness restricts equipment use for a period of 1 to 3 months. A rating of *severe* indicates that equipment use is severely restricted either as to the kind of equipment that can be used or the season of use. If the soil is wet, the wetness restricts equipment use for more than 3 months.

Seedling mortality refers to the death of naturally occurring or planted tree seedlings, as influenced by the kinds of soil, soil wetness, or topographic conditions. The factors used in rating the soils for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, effective rooting depth, and slope aspect. A rating of *slight* indicates that seedling mortality is not likely to be a problem under normal conditions. Expected mortality is less than 25 percent. A rating of *moderate* indicates that some problems from seedling mortality can be expected. Extra precautions are advisable. Expected

Figure 18.—Harvesting mature trees improves the long-term commercial value of this woodland in an area of Hickory and Wellston soils.

mortality is 25 to 50 percent. A rating of *severe* indicates that seedling mortality is a serious problem. Extra precautions are important. Replanting may be necessary. Expected mortality is more than 50 percent.

Windthrow hazard is the likelihood that trees will be uprooted by the wind because the soil is not deep enough to give adequate root anchorage. The main restrictions that affect rooting are a seasonal high water table and the depth to bedrock, a fragipan, or other limiting layers. A rating of *slight* indicates that under normal conditions no trees are blown down by the wind. Strong winds may damage trees, but they do not uproot them. A rating of *moderate* indicates that some trees can be blown down during periods when the soil is wet and winds are moderate or strong. A rating of *severe* indicates that many trees can be blown down during these periods.

The *potential productivity* of merchantable or *common trees* on a soil is expressed as a *site index* and as a *productivity class*. The site index is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands. Commonly grown trees are those that woodland managers generally favor in intermediate or improvement cuttings. They are selected on the basis of growth rate, quality, value, and marketability.

The *productivity class*, a number, is the yield likely to be produced by the most important trees. This number, expressed as cubic meters per hectare per year, indicates the amount of fiber produced on a fully stocked, even-aged, unmanaged stand.

The first species listed under *common trees* for a soil is the indicator species for that soil. It is the

dominant species on the soil and the one that determines the ordination class.

Trees to plant are those that are suitable for commercial wood production.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Table 8 shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in table 8 are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service or from a commercial nursery.

Recreation

The Washington County State Conservation Area, which surrounds Washington County Lake in the south-central part of the county, provides a variety of recreational opportunities. Several smaller public and private recreational areas are throughout the county. These include ponds, small lakes, hunting preserves, campgrounds, playgrounds, swimming pools, athletic fields, picnic grounds, and a golf course.

The soils of the survey area are rated in table 9 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 9, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or a combination of these measures.

The information in table 9 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 12 and interpretations for dwellings without basements and for local roads and streets in table 11.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the

season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

In the following paragraphs the soil associations in Washington County, which are described under the heading "General Soil Map Units," are grouped into three wildlife areas. Habitat types and animals common in each area are specified.

Wildlife area 1 consists of the Bluford-Hoyleton-Wynoose, Marine-Rushville-Muren, and Oconee-Darmstadt-Coulterville associations. The soils in this area are nearly level to moderately sloping and are on glacial till plains. They are moderately well drained, somewhat poorly drained, and poorly drained.

Land use in the area is dominantly cropland, but some scattered areas are used as pasture or woodland. Generally, the habitat available favors openland and edge-associated wildlife species. Wildlife common in the area include cottontail rabbit, red fox, coyote, redtail hawk, crow, and a variety of songbirds.

Measures that enhance the wildlife habitat in this area include delaying mowing of grass and weed cover along roadsides, ditchbanks, and waterways until after the nesting season; excluding livestock from brushy and wooded areas; maintaining and protecting roosting cover along hedgerows; and providing seed-bearing grasses, forbs, and shrubs for food and additional cover.

Wildlife area 2 consists of the Bluford-Hickory-Blair and Muren-Blair-Hickory associations. The soils in this area are nearly level to steep and are on glacial till plains. They are well drained to somewhat poorly drained.

Land use in the area is woodland, pasture, and cropland. Generally, the habitat available favors woodland, openland, and edge-associated wildlife species. Wildlife common in the area include cottontail rabbit, squirrel, whitetail deer, raccoon, opossum, turtle, quail, owl, crow, and a variety of songbirds. Wild turkey have been successfully reintroduced in the area.

Measures that enhance the wildlife habitat in this area include providing a wide diversity of tree and shrub species for the greatest diversity of woodland wildlife species; maximizing shrub and brushy edge cover around the woodland; protecting the understory by excluding livestock from the woodland; retaining dead trees for cavity-nesting, perching, and feeding sites; keeping fallen logs and brush piles as cover for prey species; and providing protection from fire.

Wildlife area 3 consists of the Hurst-Okaw and Birds-Wakeland associations. The soils in this area are nearly level and are on stream terraces and flood plains. They are somewhat poorly drained and poorly drained.

Land use in the area is cropland and woodland. Generally, the habitat available favors openland, woodland, wetland, and edge-associated wildlife species. Wildlife common in the area include squirrel, whitetail deer, raccoon, opossum, muskrat, snakes, and a variety of waterfowl and songbirds.

Measures that enhance the wildlife habitat in this area include providing a wide diversity of tree and shrub species for the greatest diversity of woodland wildlife species; maximizing shrub and brushy edge cover around the woodland; retaining dead trees for cavity-nesting, perching, and feeding sites; keeping fallen logs and brush piles as cover for prey species; protecting the woodland and wetland areas from fire; protecting the understory and wetland plants by excluding livestock from the area; delaying mowing of grass and weed cover in openland areas until after the nesting season; maintaining and protecting roosting cover along hedgerows in openland areas; providing seed-bearing grasses, forbs, and shrubs for food and additional cover in openland and near edge areas; and protecting the wetland and shallow water areas from siltation by controlling erosion in adjacent areas.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 10, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, saltgrass, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, ruffed grouse, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 11 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements,

and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 12 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 12 also shows the suitability of the soils for use as daily cover for landfill. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, and flooding affect absorption of the effluent. Large stones interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel are less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 12 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon

causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 12 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 13 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of

suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In table 13, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 14 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and for embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable

Figure 19.—Grassed waterways remove excess surface water at nonerosive velocities and help to prevent the formation of gullies.

compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, and sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity (fig. 19). Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 15 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under the heading "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1993) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1986).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The

percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 16 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage

to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing and the amount of soil lost. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

8. Soils that are not subject to soil blowing because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 16, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops (fig. 20).

Soil and Water Features

Table 17 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of

Figure 20.—The content of organic matter varies in the soils in this area of Darmstadt-Hoyleton complex, 0 to 2 percent slopes. The lighter colored areas are the Darmstadt soil, which has a low content of organic matter in the surface layer. The Hoyleton soil, in the darker areas, has a moderate content of organic matter.

water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in table 17, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, nor is water in swamps and marshes.

Table 17 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed

as none, rare, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); and *frequent* that it occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 days to 1 month, and *very long* if more than 1 month. Probable dates are expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 17 are the depth to the seasonal high water table; the kind of water table—that is, perched or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 17.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

Depth to bedrock is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low, moderate,* or *high,* is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low, moderate,* or *high.* It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (USDA, 1975). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 18 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol.* An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Fluvaquents (*Fluv*, meaning flood plain, plus *aquents*, the suborder of the Entisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Fluvaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-silty, mixed, nonacid, mesic Typic Fluvaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" (USDA, 1993). Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" (USDA, 1975). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Alford Series

Depth class: Very deep
Drainage class: Well drained

Permeability: Moderate
Landform: Till plains
Position on the landform: Crests, interfluves, and side slopes
Parent material: Loess
Slope range: 2 to 10 percent
Taxonomic classification: Fine-silty, mixed, mesic Typic Hapludalfs

Typical Pedon

Alford silt loam, 2 to 5 percent slopes, eroded, 1,260 feet west and 1,740 feet south of the northeast corner of sec. 30, T. 3 S., R. 4 W.

Ap—0 to 8 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; few fine roots; few dark yellowish brown (10YR 4/4) fragments of subsoil material; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Bt1—8 to 13 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Bt2—13 to 24 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Bt3—24 to 35 inches; yellowish brown (10YR 5/4) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Bt4—35 to 54 inches; yellowish brown (10YR 5/4) silt loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common distinct strong brown (7.5YR 4/6) and brown (10YR 5/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Bt5—54 to 60 inches; dark yellowish brown (10YR 4/6) and yellowish brown (10YR 5/4) silt loam; few fine distinct brown (10YR 5/3) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; few distinct strong brown (7.5YR 4/6) clay films on faces of peds; few distinct white (10YR 8/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid.

Range in Characteristics

Ap or A horizon:
Chroma—2 or 3
Percent clay—12 to 26

Bt horizon:
Hue—10YR or 7.5YR
Percent clay—22 to 32

BC horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—4 to 6
Texture—silt loam

Atlas Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landform: Till plains
Position on the landform: Side slopes and head slopes
Parent material: Paleosol that formed in glacial till with a thin mantle of loess
Slope range: 10 to 15 percent
Taxonomic classification: Fine, montmorillonitic, mesic, sloping Aeric Ochraqualfs

Typical Pedon

Atlas silty clay loam, 10 to 15 percent slopes, severely eroded, 1,200 feet north and 1,680 feet west of the southeast corner of sec. 3, T. 3 S., R. 3 W.

Ap—0 to 7 inches; brown (10YR 4/3) silty clay loam, pale brown (10YR 6/3) dry; weak medium granular structure; friable; few fine roots; many grayish brown (10YR 5/2) fragments of subsoil material; neutral; abrupt smooth boundary.

Btg1—7 to 12 inches; grayish brown (10YR 5/2) silty clay loam; common fine prominent yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; firm; few fine roots; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common very fine sand and fine sand visible on faces of peds; few fine

rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Btg2—12 to 21 inches; grayish brown (10YR 5/2) silty clay; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common very fine sand and fine sand visible on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Btg3—21 to 27 inches; grayish brown (10YR 5/2) silty clay loam; few fine prominent strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few distinct brown (10YR 4/3) and common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common very fine sand and fine sand visible on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg4—27 to 37 inches; gray (10YR 5/1) clay loam; common fine prominent strong brown (7.5YR 5/6) and few fine prominent strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btg5—37 to 50 inches; gray (10YR 5/1) clay loam; common fine prominent (7.5YR 5/6 and 5/8) mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; firm; few distinct brown (10YR 5/3) and grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; mildly alkaline; clear smooth boundary.

BCg—50 to 60 inches; gray (10YR 5/1) clay; few fine prominent (7.5YR 5/6 and 5/8) mottles; weak coarse prismatic structure; firm; few fine rounded accumulations of iron and manganese oxide; mildly alkaline.

Range in Characteristics

Thickness of the loess: Less than 20 inches

Ap horizon:
Value—4 or 5
Chroma—2 or 3
Texture—silty clay loam
Percent clay—25 to 39

2Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, silty clay, clay, or clay loam
Percent clay—30 to 45

2BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, silty clay, clay, or clay loam

Ava Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Landform: Till plains
Position on the landform: Crests, interfluves, and side slopes
Parent material: Loess and the underlying silty and loamy sediments
Slope range: 2 to 18 percent
Taxonomic classification: Fine-silty, mixed, mesic Typic Fragiudalfs
Taxadjunct features: The Ava soils in this county do not have peds in the Bx horizon that are polygonal or that express a strong degree of brittleness, which is characteristic of a fragipan. These soils are classified as fine-silty, mixed, mesic Typic Hapludalfs.

Typical Pedon

Ava silt loam, 2 to 5 percent slopes, 460 feet east and 240 feet north of the southwest corner of sec. 34, T. 3 S., R. 1 W.

Ap—0 to 10 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; common fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—10 to 13 inches; yellowish brown (10YR 5/4) silt loam; weak thick platy structure parting to moderate fine and medium subangular blocky; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt—13 to 16 inches; light yellowish brown (10YR 6/4) silt loam; moderate fine and medium subangular

blocky structure; friable; few fine roots; few faint yellowish brown (10YR 5/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; abrupt smooth boundary.

B/E—16 to 20 inches; brown (10YR 5/3) silty clay loam (B); white (10YR 8/1) silt (E); the E material occurs as many prominent dry coatings on faces of peds and as fillings in spaces between peds; few fine distinct yellowish brown (10YR 5/6) mottles; strong fine and medium subangular blocky structure; friable; few fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

B′t1—20 to 25 inches; brown (10YR 5/3) silty clay loam; few fine prominent strong brown (7.5YR 5/6) mottles; strong medium subangular blocky structure; friable; few fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; many distinct white (10YR 8/1 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; abrupt smooth boundary.

B′t2—25 to 34 inches; brown (10YR 5/3) silty clay loam; few fine prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few distinct white (10YR 8/1 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Btx—34 to 54 inches; brown (10YR 5/3) silty clay loam; few fine prominent strong brown (7.5YR 4/6) and few fine and medium prominent light gray (10YR 7/2) mottles; moderate coarse prismatic structure; firm; slightly brittle; few very fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few distinct white (10YR 8/1 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

2BC—54 to 60 inches; yellowish brown (10YR 5/4) silt loam; many coarse distinct grayish brown (10YR 5/2), common fine prominent dark brown (10YR 4/4), and common fine prominent strong brown (7.5YR 4/6) mottles; weak coarse prismatic structure; friable; few fine rounded accumulations of iron and manganese oxide; common very fine sand and fine sand visible on faces of peds; very strongly acid.

Range in Characteristics

Depth to fragipan: 28 to 40 inches
Thickness of the loess: 30 to 55 inches

Ap or A horizon:
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silty clay loam
Percent clay—20 to 35

E horizon:
Value—4 or 5
Chroma—3 to 6
Percent clay—20 to 27

Bt horizon:
Value—4 to 6
Chroma—3 to 6
Texture—silt loam or silty clay loam
Percent clay—24 to 35

B part of the B/E horizon:
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

E part of the B/E horizon:
Value—7 or 8
Chroma—1 or 2
Texture—silt or silt loam

B′t horizon:
Value—4 to 6
Chroma—3 to 6

Btx or 2Btx horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—2 to 8
Texture—silty clay loam or silt loam

2BC or 2C horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—2 to 6
Texture—silt loam or loam

Banlic Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Flood plains

Parent material: Silty alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts

Typical Pedon

Banlic silt loam, frequently flooded, 2,160 feet south and 2,260 feet east of the northwest corner of sec. 31, T. 5 S., R. 2 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; friable; few very fine and fine roots; few fine rounded accumulations of iron and manganese oxide; mildly alkaline; abrupt smooth boundary.

A—5 to 8 inches; brown (10YR 4/3) silt loam; many fine faint dark yellowish brown (10YR 4/4) mottles; weak fine and medium subangular blocky structure; friable; few very fine and fine roots; few fine and medium rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—8 to 13 inches; brown (10YR 5/3) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak fine and medium subangular blocky structure; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bw—13 to 21 inches; pale brown (10YR 6/3) silt loam; common fine distinct light brownish gray (10YR 6/2) and common fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bx1—21 to 27 inches; brown (10YR 5/3) silt loam; common fine faint light brownish gray (10YR 6/2) and common medium distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; firm; brittle; few very fine roots; common prominent white (10YR 8/1 dry) silt coatings on faces of peds; common fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bx2—27 to 38 inches; brown (10YR 5/3) silt loam; common medium distinct light brownish gray (10YR 6/2) and common medium distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; firm; brittle; few very fine roots; common prominent white (10YR 8/1 dry) silt coatings on vertical faces of peds; common fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

BCg—38 to 55 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak coarse subangular blocky structure; friable; few very fine roots; few distinct white (10YR 8/1 dry) silt coatings on faces of peds; common medium rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Cg—55 to 60 inches; mottled light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) silt loam; massive; friable; many fine rounded accumulations of iron and manganese oxide; slightly acid.

Range in Characteristics

Depth to Bx horizon: 20 to 24 inches

Ap horizon:
Value—4 or 5
Percent clay—10 to 18

Bw horizon:
Hue—10YR
Value—5 or 6
Chroma—2 or 3
Percent clay—12 to 18

Cg horizon:
Value—5 or 6
Chroma—2 to 4

Belknap Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Flood plains
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Coarse-silty, mixed, acid, mesic Aeric Fluvaquents

Typical Pedon

Belknap silt loam, frequently flooded, 90 feet north and 125 feet west of the center of sec. 32, T. 6 S., R. 3 W.

Ap—0 to 9 inches; brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; few faint grayish brown (10YR 5/2) mottles; weak fine granular structure; friable; few very fine roots; neutral; abrupt smooth boundary.

C1—9 to 15 inches; stratified grayish brown (10YR 5/2) and brown (10YR 4/3) silt loam; common fine and medium distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

C2—15 to 22 inches; stratified brown (10YR 5/3) and grayish brown (10YR 5/2) silt loam; common fine and medium distinct dark yellowish brown (10YR 4/4) mottles; massive; friable; few very fine roots; common fine and medium rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

C3—22 to 34 inches; stratified brown (10YR 5/3) and light brownish gray (10YR 6/2) silt loam; common fine and medium faint brown (10YR 4/3) mottles; massive; friable; very strongly acid; gradual smooth boundary.

C4—34 to 60 inches; brown (10YR 5/3) silt loam; common fine faint brown (10YR 4/3) and common medium distinct dark yellowish brown (10YR 4/4) and light brownish gray (10YR 6/2) mottles; massive; friable; very strongly acid.

Range in Characteristics

Ap horizon:
Value—4 or 5
Chroma—2 or 3
Percent clay—8 to 18

C horizon:
Chroma—1 to 3
Percent clay—8 to 25

Birds Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Flood plains
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, nonacid, mesic Typic Fluvaquents

Typical Pedon

Birds silt loam, frequently flooded, 1,020 feet east and 1,280 feet south of the northwest corner of sec. 33, T. 1 N., R. 3 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; few fine distinct yellowish brown (10YR 5/6) mottles; weak fine granular structure; friable; common fine and few medium roots; neutral; abrupt smooth boundary.

Cg1—9 to 18 inches; gray (10YR 5/1) silt loam; common fine faint light gray (10YR 6/1) and few fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Cg2—18 to 32 inches; gray (10YR 5/1) silt loam; few fine faint light gray (10YR 6/1) and common fine prominent yellowish brown (10YR 5/6 and 5/8) mottles; massive; friable; few fine roots; few dark grayish brown (10YR 4/2) krotovinas; few fine rounded accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

Cg3—32 to 45 inches; light gray (10YR 6/1) silt loam; common fine faint gray (10YR 5/1), few fine prominent yellowish brown (10YR 5/6), and common fine prominent yellowish brown (10YR 5/8) mottles; massive; friable; few fine roots; few fine faint white (10YR 8/1 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Cg4—45 to 60 inches; gray (10YR 5/1), stratified silty clay loam and silt loam; common medium prominent yellowish brown (10YR 5/8) and few fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; few fine and very fine roots; common faint dark gray (10YR 4/1) films along root channels; few fine rounded accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Ap or A horizon:
Value—4 to 6
Chroma—1 or 2
Percent clay—15 to 25

ACg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 to 7
Chroma—1 or 2
Texture—silt loam or stratified silt loam and silty clay loam
Percent clay—18 to 27

Blair Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Till plains
Position on the landform: Side slopes and head slopes
Parent material: Silty and loamy sediments
Slope range: 5 to 15 percent
Taxonomic classification: Fine-silty, mixed, mesic Aquic Hapludalfs

Typical Pedon

Blair silt loam, 5 to 10 percent slopes, eroded, 440 feet east and 1,680 feet south of the northwest corner of sec. 28, T. 3 S., R. 2 W.

Ap—0 to 6 inches; brown (10YR 5/3) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; common fine and few medium roots; few yellowish brown (10YR 5/4) fragments of subsoil material; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Bt1—6 to 13 inches; yellowish brown (10YR 5/4) silty clay loam; few fine faint grayish brown (10YR 5/2) and few fine faint yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; common faint brown (10YR 5/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt2—13 to 19 inches; yellowish brown (10YR 5/4) silty clay loam; few fine prominent strong brown (7.5YR 5/6) and common medium distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt3—19 to 26 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) and few fine prominent strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few faint light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; common very fine sand and fine sand visible on faces of peds; very strongly acid; clear smooth boundary.

Bt4—26 to 38 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; friable; few very fine roots; common distinct dark yellowish brown (10YR 4/3) and grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; common very fine sand and fine sand visible on faces of peds; very strongly acid; clear smooth boundary.

Btg1—38 to 44 inches; grayish brown (10YR 5/2) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; friable; few very fine roots; many faint brown (10YR 5/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; common very fine sand and fine sand visible on faces of peds; strongly acid; clear smooth boundary.

Btg2—44 to 55 inches; grayish brown (10YR 5/2) silty clay loam; few fine distinct yellowish brown (10YR 5/4) and few fine prominent strong brown (7.5YR 4/6) mottles; moderate coarse prismatic structure; friable; few very fine roots; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; common very fine sand and fine sand visible on faces of peds; strongly acid; gradual smooth boundary.

Btg3—55 to 60 inches; grayish brown (10YR 5/2) silty clay loam; few fine distinct yellowish brown (10YR 5/4) and few fine prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; common faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; common very fine sand and fine sand visible on faces of peds; slightly acid.

Range in Characteristics

Depth to glacial till: Typically more than 60 inches but ranges from 36 to 60 inches in some pedons
Thickness of the loess: Less than 20 inches

Ap horizon:
Value—4 or 5
Chroma—2 to 4
Texture—silt loam or silty clay loam
Percent clay—20 to 35

E horizon (if it occurs):
Percent clay—20 to 27

Bt horizon:
Hue—10YR in the upper part, 10YR or 2.5Y in the lower part
Value—4 to 6
Chroma—2 to 4 in the upper part, 1 or 2 in the lower part
Texture—silty clay loam, silt loam, or loam
Percent clay—25 to 35

2Bt or 2Btg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 3
Texture—silty clay loam or clay loam

BCg, 2BCg, Cg, or 2Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or loam

Bluford Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Till plains
Position on the landform: Crests, side slopes, head slopes, interfluves, and broad summits
Parent material: Loess and the underlying silty and loamy sediments
Slope range: 0 to 5 percent
Taxonomic classification: Fine, montmorillonitic, mesic Aeric Ochraqualfs

Typical Pedon

Bluford silt loam, 2 to 5 percent slopes, 560 feet north and 2,500 feet west of the southeast corner of sec. 31, T. 3 S., R. 2 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak very fine and fine granular structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—6 to 13 inches; light brownish gray (10YR 6/2) silt loam; moderate thick platy structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid; abrupt smooth boundary.

Bt/E—13 to 16 inches; brown (10YR 5/3) silty clay loam (Bt); white (10YR 8/1) silt (E); the E material occurs as many distinct dry coatings on faces of peds and as fillings in spaces between peds; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt1—16 to 28 inches; brown (10YR 5/3) silty clay; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few faint light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt2—28 to 37 inches; brown (10YR 5/3) silty clay loam; common fine prominent yellowish brown (10YR 5/8) and many coarse distinct gray (10YR 5/1) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few medium distinct white (5YR 8/1) barium sulfate crystals on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

2Btx—37 to 50 inches; brown (10YR 5/3) silty clay loam; few fine prominent strong brown (7.5YR 4/6), few fine distinct yellowish brown (10YR 5/6), and many coarse distinct gray (10YR 5/1) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; slightly brittle; few faint dark yellowish brown (10YR 4/4) and common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few medium distinct white (5YR 8/1) barium sulfate crystals on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

2BCg—50 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; few fine prominent strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure; friable; common very fine sand and fine sand visible on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid.

Range in Characteristics

Depth to the fragipan: 35 to 48 inches
Thickness of the loess: 30 to 55 inches

Ap horizon:
Value—4 or 5
Chroma—2 or 3
Percent clay—20 to 27

E horizon:
Value—4 to 6
Chroma—2 to 4
Percent clay—15 to 25

Bt horizon:
Value—4 to 6
Chroma—2 to 4
Percent clay—35 to 42

Btx or 2Btx horizon (if it occurs):
Value—4 to 6
Chroma—2 to 4
Texture—silty clay loam, silt loam, or loam

2BCg or 2Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam, loam, or silty clay loam

Bonnie Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Flood plains
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, acid, mesic Typic Fluvaquents

Typical Pedon

Bonnie silt loam, frequently flooded, 2,590 feet south and 59 feet west of the center of sec. 34, T. 6 S., R. 3 W.

Ap—0 to 6 inches; grayish brown (10YR 5/2) silt loam, light gray (10YR 7/2) dry; few fine and medium distinct yellowish brown (10YR 5/6) mottles; weak medium granular structure; friable; common fine roots; common distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; medium acid; clear smooth boundary.

Cg1—6 to 12 inches; light brownish gray (10YR 6/2) silt loam; few fine faint brown (10YR 5/3) and few fine distinct brownish yellow (10YR 6/6) mottles; weak fine granular structure; friable; few fine roots; common fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Cg2—12 to 19 inches; thinly stratified light brownish gray (10YR 6/2) and grayish brown (10YR 5/2) silt loam; many medium prominent strong brown (7.5YR 5/6) mottles; massive; friable; few fine roots; common fine and medium rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Cg3—19 to 26 inches; stratified light brownish gray (2.5Y 6/2) silt loam and light gray (10YR 7/2) silt; common fine prominent strong brown (7.5YR 5/6) mottles; massive; friable; few fine roots; common fine rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Cg4—26 to 60 inches; stratified light brownish gray (2.5Y 6/2) silty clay loam and light gray (10YR 7/2) silt; few fine distinct pale brown (10YR 6/3) and few fine prominent reddish yellow (7.5YR 6/6) and strong brown (7.5YR 5/6) mottles; massive; friable; few fine roots; common fine rounded accumulations of iron and manganese oxide; very strongly acid.

Range in Characteristics

Ap or A horizon:
Value—4 or 5
Chroma—1 or 2
Percent clay—18 to 27

Cg horizon:
Hue—10YR or 2.5Y
Percent clay—18 to 30

Cisne Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess and the underlying silty and loamy sediments
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Mollic Albaqualfs

Typical Pedon

Cisne silt loam, 2,440 feet south and 1,480 feet west of the northeast corner of sec. 13, T. 1 S., R. 1 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and medium granular structure;

friable; common fine roots; neutral; abrupt smooth boundary.

Eg1—8 to 12 inches; dark grayish brown (10YR 4/2) silt loam; moderate thick platy structure; friable; few fine roots; few faint very dark grayish brown (10YR 3/2) organic films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Eg2—12 to 17 inches; light brownish gray (10YR 6/2) silt loam; few fine faint brown (10YR 4/3) mottles; moderate thick platy structure; friable; few fine roots; common faint white (10YR 8/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Btg1—17 to 20 inches; grayish brown (10YR 5/2) silty clay loam; few fine prominent strong brown (7.5YR 4/6) mottles; moderate medium subangular blocky structure; friable; few fine roots; many faint dark gray (10YR 4/1) clay films on faces of peds; few distinct white (10YR 8/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Btg2—20 to 27 inches; dark grayish brown (2.5Y 4/2) silty clay; few fine prominent strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg3—27 to 38 inches; grayish brown (2.5Y 5/2) silty clay; few fine prominent strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg4—38 to 48 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent dark yellowish brown (10YR 4/4) and few fine prominent strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure; firm; few very fine roots; many faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

2Btg5—48 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure; friable; common distinct gray (5Y 5/1) clay films on faces of peds; common very fine sand and fine sand visible on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid.

Range in Characteristics

Thickness of the loess: 36 to 55 inches

Ap horizon:
Chroma—1 or 2
Percent clay—15 to 27

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 7
Chroma—1 or 2
Percent clay—15 to 27

Btg horizon:
Chroma—1 or 2
Percent clay—35 to 45

2Btg or 2BCg horizon (if it occurs):
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, clay loam, loam, or silt loam

2Cg horizon (if it occurs):
Hue—2.5Y or 10YR
Value—4 to 6
Chroma—1 or 2
Texture—loam or silt loam

Colp Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Slow
Landform: Stream terraces
Position on the landform: Breaks
Parent material: Lacustrine sediments or alluvium with a thin mantle of loess
Slope range: 2 to 7 percent
Taxonomic classification: Fine, montmorillonitic, mesic Aquic Hapludalfs

Typical Pedon

Colp silty clay loam, 2 to 5 percent slopes, eroded, rarely flooded, 500 feet north and 540 feet west of the southeast corner of sec. 29, T. 1 S., R. 5 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silty clay loam, light brownish gray (10YR 6/2)

dry; moderate very fine and fine granular structure; friable; common very fine and fine roots; few brown (10YR 4/3) fragments of subsoil material; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

2Bt1—5 to 10 inches; brown (10YR 4/3) silty clay loam; moderate medium prismatic structure; firm; few very fine and fine roots; many distinct dark brown (10YR 3/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

2Bt2—10 to 17 inches; brown (10YR 4/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and few fine faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure; firm; few very fine and fine roots; many distinct dark brown (10YR 3/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

2Bt3—17 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; few fine prominent strong brown (7.5YR 4/6) mottles; weak medium prismatic structure parting to moderate coarse subangular blocky; firm; few very fine roots; few distinct grayish brown (10YR 5/2) and many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

2Bt4—27 to 35 inches; brown (10YR 5/3) silty clay; common fine distinct yellowish brown (10YR 5/6) and few fine prominent strong brown (7.5YR 4/6) mottles; weak medium prismatic structure parting to moderate coarse subangular blocky; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

2Bt5—35 to 51 inches; brown (10YR 5/3) silty clay; common fine prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

2Btg—51 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid.

Range in Characteristics

Depth to carbonates: More than 42 inches
Thickness of the loess: Less than 20 inches

Ap horizon:
Value—4 or 5
Chroma—1 to 4
Texture—silt loam or silty clay loam
Percent clay—20 to 35

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silty clay loam, silty clay, or clay; thin strata of silt loam in some pedons
Percent clay—35 to 50

2Btg or 2BCg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Texture—silty clay loam, silty clay, or clay; thin strata of silt loam in some pedons

2Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silty clay loam or silty clay; stratified with silt loam in some pedons

Coulterville Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Till plains
Position on the landform: Crests, side slopes, head slopes, and broad summits
Parent material: Loess or loess and the underlying silty and loamy sediments
Slope range: 0 to 5 percent
Taxonomic classification: Fine-silty, mixed, mesic Aeric Ochraqualfs
Taxadjunct features: The Coulterville soil in map unit 880A has more clay in the control section than is defined as the range for the series. This soil is classified as fine, montmorillonitic, mesic Aeric Ochraqualfs.

Typical Pedon

Coulterville silt loam, in an area of Darmstadt-Coulterville complex, 2 to 5 percent slopes, eroded, 2,480 feet west and 1,300 feet north of the southeast corner of sec. 28, T. 3 S., R. 5 W.

Ap—0 to 5 inches; brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine and medium granular structure; friable; few fine roots; few brown (10YR 5/3) fragments of subsoil material; few fine rounded accumulations of iron and manganese oxide; medium acid; abrupt smooth boundary.

Bt1—5 to 11 inches; brown (10YR 5/3) silty clay loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—11 to 16 inches; brown (10YR 5/3) silty clay loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine and very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btn1—16 to 25 inches; brown (10YR 5/3) silty clay loam; common fine faint grayish brown (10YR 5/2) and few fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many distinct dark grayish brown (10YR 4/2) and common distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; moderately alkaline; clear smooth boundary.

Btn2—25 to 34 inches; brown (10YR 5/3) silty clay loam; common fine faint grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; moderately alkaline; clear smooth boundary.

Btn3—34 to 43 inches; brown (10YR 5/3) silt loam; common fine faint grayish brown (10YR 5/2) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; moderately alkaline; gradual smooth boundary.

2Btn4—43 to 51 inches; grayish brown (10YR 5/2) silt loam; few fine distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; few distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; common very fine sand and fine sand visible on faces of peds; moderately alkaline; gradual smooth boundary.

2Cg—51 to 60 inches; dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) silt loam; few fine distinct yellowish brown (10YR 5/4) mottles; massive; friable; few fine rounded accumulations of iron and manganese oxide; common very fine sand and fine sand visible along pores; moderately alkaline.

Range in Characteristics

Depth to carbonates: 25 to 60 inches in some pedons
Depth to concentration of 5 to 14 percent exchangeable sodium: 10 to 40 inches
Thickness of the loess: More than 40 inches

Ap horizon:
Value—3 or 4
Chroma—2 or 3
Texture—silt loam or silty clay loam
Percent clay—15 to 35

E horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—2 or 3
Texture—silt loam
Percent clay—15 to 27

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 4
Texture—silty clay loam; subhorizons of silt loam or silty clay in some pedons
Percent clay—27 to 35

BC or 2BC horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3
Texture—silt loam or silty clay loam

BCg or 2BCg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—5 or 6
Chroma—1 or 2
Texture—silt loam or silty clay loam

Cg or 2Cg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 7
Chroma—1 or 2

Cowden Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Mollic Albaqualfs

Typical Pedon

Cowden silt loam, 1,280 feet south and 80 feet west of the northeast corner of sec. 14, T. 2 S., R. 3 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate very fine and fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

Eg1—9 to 12 inches; grayish brown (10YR 5/2) silt loam; weak thin platy structure; friable; few fine roots; few faint light gray (10YR 7/1 dry) silt coatings on faces of peds; neutral; abrupt smooth boundary.

Eg2—12 to 16 inches; grayish brown (10YR 5/2) silt loam; few fine distinct yellowish brown (10YR 5/4) mottles; moderate thick platy structure; friable; few fine roots; common faint light gray (10YR 7/1 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Btg1—16 to 24 inches; dark grayish brown (10YR 4/2) silty clay loam; many fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine and fine roots; many faint dark gray (10YR 4/1) and few faint very dark gray (10YR 3/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—24 to 31 inches; dark grayish brown (2.5Y 4/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine and fine roots; many distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Btg3—31 to 38 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; firm; few very fine roots; few faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

BCg—38 to 50 inches; olive gray (5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; few distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Cg—50 to 60 inches; gray (5Y 6/1) silt loam; common fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; common fine rounded accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the loess: More than 55 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2
Percent clay—17 to 27

Eg horizon:
Value—4 to 6
Chroma—1 or 2
Percent clay—17 to 27

Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay; silt loam in the lower part in some pedons
Percent clay—35 to 42

BCg or Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or silty clay loam

2Cg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or loam

Creal Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Stream terraces
Position on the landform: Treads
Parent material: Loess and silty local alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, mesic Aeric Ochraqualfs

Typical Pedon

Creal silt loam, 0 to 2 percent slopes, rarely flooded, 1,820 feet west and 1,660 feet south of the northeast corner of sec. 8, T. 1 S., R. 4 W.

Ap1—0 to 5 inches; brown (10YR 5/3) silt loam, very pale brown (10YR 7/3) dry; moderate medium granular structure; friable; few medium and common fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Ap2—5 to 14 inches; dark grayish brown (10YR 4/2) silt loam; few fine faint brown (10YR 4/3) mottles; weak medium subangular blocky structure; friable; common fine roots; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

E1—14 to 25 inches; brown (10YR 4/3) silt loam; common fine faint dark grayish brown (10YR 4/2) mottles; weak thick platy structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; common distinct very dark gray (10YR 3/1) organic films along root channels; medium acid; clear smooth boundary.

E2—25 to 31 inches; brown (10YR 4/3) and dark grayish brown (10YR 4/2) silt loam; few fine distinct dark yellowish brown (10YR 4/6) mottles; weak thick platy structure; friable; few very fine roots; common fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt1—31 to 37 inches; dark yellowish brown (10YR 4/4) silty clay loam; common fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; common fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—37 to 42 inches; brown (10YR 4/3) silty clay loam; common fine distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Btg—42 to 49 inches; gray (10YR 6/1) silty clay loam; common medium prominent strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure; friable; few distinct dark grayish brown (10YR 4/2) and common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

BCg—49 to 60 inches; gray (10YR 6/1) silty clay loam; common medium prominent strong brown (7.5YR 5/6) and common medium distinct brownish yellow (10YR 6/6) mottles; weak medium prismatic structure; friable; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Ap horizon:
Value—4 or 5
Chroma—2 to 4
Percent clay—20 to 27

E horizon:
Value—4 to 6
Chroma—2 to 4
Percent clay—18 to 25

Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 or 4
Texture—silty clay loam or silt loam
Percent clay—25 to 35

Btg or BCg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silt loam

Darmstadt Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Very slow
Landform: Till plains
Position on the landform: Crests, side slopes, head slopes, and broad summits
Parent material: Loess or loess and the underlying silty and loamy sediments
Slope range: 0 to 5 percent
Taxonomic classification: Fine-silty, mixed, mesic Albic Natraqualfs

Typical Pedon

Darmstadt silt loam, in an area of Darmstadt-Coulterville complex, 0 to 2 percent slopes, 140 feet west and 1,440 feet north of the southeast corner of sec. 3, T. 1 S., R. 3 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine and medium granular structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—8 to 13 inches; grayish brown (10YR 5/2) silt loam; weak thick platy structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

Bt1—13 to 17 inches; brown (10YR 5/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and common fine faint grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure parting to moderate fine angular blocky; friable; few very fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Bt2—17 to 22 inches; brown (10YR 4/3) silty clay loam; common fine distinct brownish yellow (10YR 6/8) and common fine faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; firm; few very fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Bt3—22 to 33 inches; brown (10YR 5/3) silty clay loam; common fine prominent strong brown (7.5YR 5/6 and 5/8) and common fine faint grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; few very fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; moderately alkaline; clear smooth boundary.

Btg—33 to 41 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine and medium prominent strong brown (7.5YR 5/6 and 5/8) mottles; moderate medium subangular blocky structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; moderately alkaline; clear smooth boundary.

BCg—41 to 51 inches; light gray (2.5Y 7/2) silt loam; common medium prominent strong brown (7.5YR 5/6 and 5/8) and few fine faint grayish brown (2.5Y 5/2) mottles; weak medium prismatic structure; friable; few fine rounded accumulations of iron and manganese oxide; moderately alkaline; gradual smooth boundary.

Cg—51 to 60 inches; light gray (10YR 7/2) silt loam; common medium prominent strong brown (7.5YR 5/6 and 5/8) and few fine faint brown (10YR 5/3) mottles; massive; friable; few fine rounded accumulations of iron and manganese oxide; moderately alkaline.

Range in Characteristics

Depth to carbonates: Calcium carbonate concretions below a depth of 24 inches in some pedons
Depth to the natric horizon: 6 to 16 inches below the upper boundary of the Bt horizon
Percent exchangeable sodium in the natric horizon: 15 or more
Thickness of the loess: More than 40 inches

Ap horizon:
Value—3 to 5
Chroma—2 or 3
Percent clay—10 to 27

E horizon:
Value—5 or 6
Percent clay—10 to 27

Bt horizon:
Value—4 to 7
Chroma—2 to 4
Texture—silty clay loam or silt loam; thin subhorizons of silty clay in some pedons
Percent clay—27 to 35

BCg and Cg horizons:
Value—6 or 7
Chroma—1 or 2

2Btg, 2BCg, or 2Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—6 or 7
Chroma—1 or 2
Texture—silt loam or silty clay loam

Ebbert Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, mesic Argiaquic Argialbolls

Typical Pedon

Ebbert silt loam, 50 feet north and 1,200 feet east of the southwest corner of sec. 11, T. 1 S., R. 4 W.

Ap—0 to 7 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate very fine and fine granular structure; friable; few fine roots; slightly acid; abrupt smooth boundary.

A—7 to 12 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate very fine and fine granular structure; friable; few fine roots; slightly acid; abrupt smooth boundary.

Eg—12 to 22 inches; dark gray (10YR 4/1) silt loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate thin platy structure; friable; few fine roots; common faint very dark gray (10YR 3/1) organic films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Btg1—22 to 29 inches; dark gray (10YR 4/1) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common faint very dark gray (10YR 3/1) clay films and organic films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg2—29 to 37 inches; gray (10YR 5/1) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; few faint very dark gray (10YR 3/1) and common faint dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg3—37 to 50 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; few fine roots; few distinct dark gray (10YR 4/1) and common faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Btg4—50 to 60 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; firm; common distinct dark gray (10YR 4/1) and few faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the loess: More than 60 inches

Ap or A horizon:
Value—2 or 3
Percent clay—20 to 27

Eg horizon:
Value—4 or 5
Chroma—1 or 2
Percent clay—18 to 25

Btg horizon:
Hue—10YR, 2.5Y, 5Y, or neutral
Value—3 to 5 in the upper part, 4 to 6 in the lower part
Chroma—1 in the upper part, 0 to 2 in the lower part
Texture—silty clay loam or silt loam
Percent clay—24 to 35

Geff Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Stream terraces
Position on the landform: Treads
Parent material: Loess and the underlying loamy sediments
Slope range: 2 to 5 percent

Taxonomic classification: Fine-silty, mixed, mesic Aquic Hapludalfs

Typical Pedon

Geff silt loam, 2 to 5 percent slopes, 2,160 feet north and 1,780 feet east of the southwest corner of sec. 29, T. 1 S., R. 1 W.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate medium granular structure; friable; common fine and medium roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—8 to 12 inches; dark grayish brown (10YR 4/2) and brown (10YR 5/3) silt loam; moderate thick platy structure; friable; common fine roots; few fine rounded accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

EB—12 to 17 inches; light brownish gray (10YR 6/2) and light yellowish brown (10YR 6/4) silt loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium subangular blocky structure; friable; common fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid; abrupt smooth boundary.

Bt1—17 to 24 inches; yellowish brown (10YR 5/4) silty clay loam; common fine prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—24 to 33 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct grayish brown (10YR 5/2) and common medium prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure; friable; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

2Bt3—33 to 47 inches; dark yellowish brown (10YR 4/4) silt loam; many coarse distinct grayish brown (10YR 5/2) and common medium prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure; friable; few very fine roots; few distinct brown (10YR 4/3) clay films on faces of peds; common fine rounded accumulations of iron and manganese oxide; common very fine sand and fine sand visible on faces of peds; strongly acid; gradual smooth boundary.

2BC—47 to 60 inches; dark yellowish brown (10YR 4/4) silt loam; common medium prominent strong brown (7.5YR 4/6), dark brown (7.5YR 4/4), and brown (7.5YR 5/2) mottles; weak medium prismatic structure; friable; few very fine roots; common fine rounded accumulations of iron and manganese oxide; common very fine sand and fine sand visible on faces of peds; slightly acid.

Range in Characteristics

Thickness of the loess: 24 to 40 inches

Ap horizon:
Value—4 or 5
Chroma—2 or 3
Percent clay—18 to 27

E horizon:
Value—4 to 6
Percent clay—18 to 27

Bt horizon:
Value—4 to 6
Chroma—2 to 4
Percent clay—24 to 35

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—2 to 6
Texture—silt loam, silty clay loam, loam, or sandy loam

Grantfork Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Till plains
Position on the landform: Side slopes and head slopes
Parent material: Loamy sediments and the underlying glacial till
Slope range: 5 to 15 percent
Taxonomic classification: Fine-loamy, mixed, mesic, sloping Aeric Ochraqualfs

Typical Pedon

Grantfork silt loam, 5 to 10 percent slopes, eroded, 520 feet south and 2,360 feet east of the northwest corner of sec. 25, T. 1 N., R. 1 W.

Ap—0 to 6 inches; brown (10YR 4/3) silt loam, pale

brown (10YR 6/3) dry; weak fine granular structure; friable; common fine roots; few brown (10YR 5/3) fragments of subsoil material; few pebbles; medium acid; abrupt smooth boundary.

Bt—6 to 17 inches; brown (10YR 4/3) clay loam; few fine prominent strong brown (7.5YR 4/6) and common fine faint light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; friable; few fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds; common very fine sand and fine sand visible on faces of peds; few fine rounded accumulations of iron and manganese oxide; few pebbles; strongly acid; clear smooth boundary.

Btg1—17 to 28 inches; grayish brown (10YR 5/2) clay loam; few fine prominent strong brown (7.5YR 4/6) and many medium distinct dark yellowish brown (10YR 4/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common very fine sand and fine sand visible on faces of peds; few fine rounded accumulations of iron and manganese oxide; few pebbles; neutral; clear smooth boundary.

Btg2—28 to 40 inches; grayish brown (10YR 5/2) clay loam; many fine prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; few faint dark grayish brown (10YR 4/2) and many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few pebbles; mildly alkaline; gradual smooth boundary.

Btg3—40 to 58 inches; light brownish gray (10YR 6/2) loam; common fine prominent strong brown (7.5YR 4/6) mottles; weak coarse prismatic structure; friable; few faint dark grayish brown (10YR 4/2) and many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine rounded accumulations of iron and manganese oxide; few pebbles; mildly alkaline; gradual smooth boundary.

Btg4—58 to 60 inches; light brownish gray (10YR 6/2) clay loam; common fine prominent reddish yellow (7.5YR 6/8) mottles; weak coarse prismatic structure; friable; few faint dark grayish brown (10YR 4/2) and common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine rounded accumulations of iron and manganese oxide; few pebbles; mildly alkaline.

Range in Characteristics

Depth to concentration of 10 to 14 percent exchangeable sodium: 10 to 40 inches

Ap horizon:
- Chroma—2 to 4
- Texture—silt loam, silty clay loam, loam, or clay loam
- Percent clay—20 to 30

Bt or 2Bt horizon (if it occurs):
- Hue—10YR or 2.5Y
- Value—4 to 6
- Chroma—3 or 4
- Texture—silty clay loam, clay loam, silt loam, or loam
- Percent clay—20 to 30

Btg or 2Btg horizon (if it occurs):
- Hue—10YR or 2.5Y
- Value—4 to 7
- Chroma—1 or 2
- Texture—silty clay loam, clay loam, silt loam, or loam

BCg or 2BCg horizon (if it occurs):
- Hue—10YR or 2.5Y
- Value—5 or 6
- Chroma—1 or 2
- Texture—silty clay loam, clay loam, silt loam, or loam

Cg or 2Cg horizon (if it occurs):
- Hue—10YR or 2.5Y
- Value—5 or 6
- Chroma—1 or 2
- Texture—clay loam, silt loam, or loam

Harrison Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform: Till plains
Position on the landform: Crests
Parent material: Loess
Slope range: 2 to 5 percent
Taxonomic classification: Fine-silty, mixed, mesic Typic Argiudolls

Typical Pedon

Harrison silt loam, 2 to 5 percent slopes, 2,540 feet north and 1,820 feet east of the southwest corner of sec. 2, T. 2 S., R. 4 W.

Ap—0 to 10 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate very fine and fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

AB—10 to 16 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; weak fine and medium subangular blocky structure parting to moderate very fine and fine granular; friable; common fine roots; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt1—16 to 23 inches; brown (10YR 4/3) silty clay loam; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt2—23 to 32 inches; brown (10YR 5/3) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and few fine faint light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; few distinct very dark gray (10YR 3/1) and many faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt3—32 to 39 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and common fine faint light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine and fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Bt4—39 to 48 inches; brown (10YR 5/3) silty clay loam; common fine faint light brownish gray (10YR 6/2) and few fine prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure; friable; few very fine roots; few faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Bt5—48 to 60 inches; brown (10YR 5/3) silt loam; common fine prominent strong brown (7.5YR 5/6) and common fine faint light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure; friable; few very fine roots; few faint grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 18 inches
Thickness of the loess: More than 60 inches

Ap horizon:
Value—2 or 3
Chroma—1 to 3
Percent clay—20 to 27

AB horizon:
Value—2 or 3
Chroma—2 or 3

BA horizon (if it occurs):
Hue—10YR
Value—3 or 4
Chroma—3
Texture—silt loam or silty clay loam

Bt horizon:
Value—4 to 6
Chroma—3 or 4
Percent clay—25 to 35

BC horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—3 or 4
Texture—silt loam

Herrick Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderately slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Aquic Argiudolls

Typical Pedon

Herrick silt loam, 0 to 2 percent slopes, 2,480 feet south and 820 feet east of the northwest corner of sec. 9, T. 2 S., R. 5 W.

Ap—0 to 9 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate very fine and fine granular structure; friable; few fine and medium roots; neutral; abrupt smooth boundary.

A—9 to 14 inches; very dark gray (10YR 3/1) silt

loam, gray (10YR 5/1) dry; moderate medium granular structure; friable; few fine roots; many faint black (10YR 2/1) organic films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

E—14 to 19 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; few fine faint brown (10YR 4/3) mottles; moderate thick platy structure; friable; few fine roots; many faint very dark gray (10YR 3/1) organic films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bt1—19 to 27 inches; dark grayish brown (10YR 4/2) silty clay loam; few fine faint brown (10YR 4/3) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; many faint very dark grayish brown (10YR 3/2) clay films and organic films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Bt2—27 to 36 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt3—36 to 43 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure; firm; few fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Btg—43 to 53 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure; friable; few very fine roots; many distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

BCg—53 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common fine prominent yellowish brown (10YR 5/8) mottles; weak medium prismatic structure; friable; few distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid.

Range in Characteristics

Thickness of the mollic epipedon: 10 to 20 inches

Ap or A horizon:
Value—2 or 3
Chroma—1 or 2
Percent clay—20 to 27

E horizon:
Value—3 or 4
Chroma—1 or 2
Percent clay—20 to 27

Bt horizon:
Chroma—2 to 4
Texture—silty clay loam or silty clay
Percent clay—35 to 42

Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6

BCg or Cg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—2
Texture—silt loam

Hickory Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderate
Landform: Till plains
Position on the landform: Side slopes and back slopes
Parent material: Glacial till or glacial till with a thin mantle of loess
Slope range: 10 to 60 percent
Taxonomic classification: Fine-loamy, mixed, mesic Typic Hapludalfs

Typical Pedon

Hickory silt loam, 15 to 30 percent slopes, 340 feet east and 360 feet north of the southwest corner of sec. 25, T. 3 S., R. 2 W.

A—0 to 3 inches; very dark grayish brown (10YR 3/2) silt loam, light brownish gray (10YR 6/2) dry; moderate very fine and fine granular structure; friable; common fine and medium roots; strongly acid; abrupt smooth boundary.

E1—3 to 7 inches; brown (10YR 4/3) silt loam; weak thick platy structure parting to moderate fine and medium subangular blocky; friable; common fine and medium roots; very strongly acid; clear smooth boundary.

E2—7 to 12 inches; yellowish brown (10YR 5/4) silt loam; weak thick platy structure parting to moderate fine and medium subangular blocky; friable; few fine and medium roots; very strongly acid; clear smooth boundary.

2Bt1—12 to 20 inches; yellowish brown (10YR 5/4) loam; moderate fine subangular blocky structure; friable; few fine roots; common distinct strong brown (7.5YR 4/6) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few pebbles; very strongly acid; clear smooth boundary.

2Bt2—20 to 25 inches; yellowish brown (10YR 5/6) clay loam; moderate medium subangular blocky structure; firm; few fine roots; common distinct strong brown (7.5YR 4/6) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few pebbles; very strongly acid; clear smooth boundary.

2Bt3—25 to 40 inches; yellowish brown (10YR 5/6) clay loam; common fine prominent strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few pebbles; very strongly acid; gradual smooth boundary.

2Bt4—40 to 60 inches; yellowish brown (10YR 5/6) clay loam; common medium prominent strong brown (7.5YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct dark yellowish brown (10YR 4/4) and few distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few pebbles; very strongly acid.

Range in Characteristics

Thickness of the loess: Less than 20 inches
Percent fine sand or coarser sand in the control section: 15 or more

A or Ap horizon:
Value—3 to 5
Chroma—2 to 4
Texture—silt loam or loam; silty clay loam or clay loam in some eroded pedons
Percent clay—19 to 35

E horizon (if it occurs):
Value—4 to 6
Chroma—2 to 4
Texture—silt loam or loam
Percent clay—19 to 25

Bt or 2Bt horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 6
Texture—clay loam, loam, or silty clay loam
Percent clay—27 to 35

BC or 2BC horizon (if it occurs):
Hue—10YR, 7.5YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—clay loam or loam

C or 2C horizon (if it occurs):
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—2 to 6
Texture—clay loam, loam, or sandy loam

Hosmer Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate in the upper part and very slow in the lower part
Landform: Till plains
Position on the landform: Crests, interfluves, and side slopes
Parent material: Loess
Slope range: 2 to 18 percent
Taxonomic classification: Fine-silty, mixed, mesic Typic Fragiudalfs
Taxadjunct features: The Hosmer soils in this county do not have peds in the Bx horizon that are polygonal or that express a strong degree of brittleness, which is characteristic of a fragipan. These soils are classified as fine-silty, mixed, mesic Typic Hapludalfs.

Typical Pedon

Hosmer silt loam, 2 to 5 percent slopes, 680 feet south and 86 feet west of the northeast corner of sec. 19, T. 5 S., R. 3 W.

Ap—0 to 7 inches; brown (10YR 4/3) silt loam, yellowish brown (10YR 5/4) dry; weak fine and medium granular structure; friable; common very fine and fine roots; common distinct dark brown (10YR 3/3) organic coatings on faces of peds; slightly acid; abrupt smooth boundary.

E—7 to 10 inches; yellowish brown (10YR 5/4) silt loam; weak medium subangular blocky structure; friable; common very fine and fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bt—10 to 17 inches; yellowish brown (10YR 5/6) silty clay loam; few fine faint yellowish brown (10YR 5/8) mottles; moderate medium subangular blocky structure; friable; common very fine and fine roots; common distinct brown (10YR 5/3) clay films on faces of peds; few distinct pale brown (10YR 6/3 dry) silt coatings on faces of peds; common fine rounded accumulations of iron and manganese oxide; very strongly acid; abrupt smooth boundary.

B/E—17 to 20 inches; yellowish brown (10YR 5/4) silty clay loam (B); light gray (10YR 7/2) silt (E); the E material occurs as many prominent dry coatings on faces of peds and as fillings in spaces between peds; common fine distinct yellowish brown (10YR 5/8) mottles; moderate very fine and fine subangular blocky structure; friable; common very fine and fine roots; common distinct brown (10YR 4/3) and dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; abrupt smooth boundary.

B′t1—20 to 29 inches; yellowish brown (10YR 5/6) silty clay loam; common fine and medium distinct grayish brown (10YR 5/2) and common fine faint yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate fine and medium subangular blocky; friable; few very fine and fine roots; many distinct brown (10YR 5/3) clay films on faces of peds; common distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

B′t2—29 to 36 inches; mottled yellowish brown (10YR 5/6 and 5/8) and grayish brown (10YR 5/2) silty clay loam; weak medium prismatic structure parting to weak medium subangular blocky; firm; few very fine roots; common distinct brown (10YR 4/3) clay films on faces of peds; common distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; common fine rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Btx—36 to 50 inches; mottled yellowish brown (10YR 5/4 and 5/8), light brownish gray (10YR 6/2), and dark yellowish brown (10YR 4/4) silty clay loam; moderate medium prismatic structure parting to weak medium subangular blocky; firm; slightly brittle; few very fine roots; few distinct brown (10YR 5/3) clay films on faces of peds; few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; common fine rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

BC—50 to 60 inches; mottled yellowish brown (10YR 5/6 and 5/8) and light brownish gray (10YR 6/2) silt loam; weak medium prismatic structure; friable; common fine rounded accumulations of iron and manganese oxide; very strongly acid.

Range in Characteristics

Depth to the fragipan: 20 to 40 inches

Ap or A horizon:
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silty clay loam
Percent clay—10 to 30

E horizon:
Value—4 or 5
Chroma—4 to 6
Percent clay—10 to 17

Bt and B′t horizons:
Value—5 or 6
Chroma—3 to 6
Percent clay—24 to 30

Hoyleton Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Till plains
Position on the landform: Crests, interfluves, side slopes, head slopes, and broad summits
Parent material: Loess and the underlying silty and loamy sediments
Slope range: 0 to 5 percent
Taxonomic classification: Fine, montmorillonitic, mesic Aquollic Hapludalfs

Typical Pedon

Hoyleton silt loam, 0 to 2 percent slopes, 420 feet north and 1,640 feet east of the southwest corner of sec. 15, T. 2 S., R. 1 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine and medium granular structure;

friable; many medium and fine roots; neutral; abrupt smooth boundary.

E1—8 to 12 inches; brown (10YR 4/3) silt loam; weak thick platy structure; friable; common medium and fine roots; few faint very dark grayish brown (10YR 3/2) organic films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

E2—12 to 15 inches; brown (10YR 5/3) silt loam; few fine prominent red (2.5YR 4/6) and few fine faint grayish brown (10YR 5/2) mottles; weak thick platy structure; friable; few medium and fine roots; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt1—15 to 22 inches; brown (10YR 5/3) silty clay loam; many fine prominent red (2.5YR 4/6) and few fine faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; many distinct very dark grayish brown (10YR 3/2) and dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—22 to 27 inches; brown (10YR 5/3) silty clay loam; common fine prominent strong brown (7.5YR 4/6) and common medium faint grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt3—27 to 34 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and many coarse faint light brownish gray (10YR 6/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common faint grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Btg—34 to 46 inches; grayish brown (10YR 5/2) silty clay loam; common fine distinct dark yellowish brown (10YR 4/4) and few fine distinct yellowish brown (10YR 5/6) mottles; weak medium prismatic structure; friable; few very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; common fine rounded accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

2BCg—46 to 60 inches; grayish brown (10YR 5/2) silt loam; many fine distinct dark yellowish brown (10YR 4/4) mottles; weak medium prismatic structure; friable; common very fine sand and fine sand visible on faces of peds; common fine rounded accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the loess: 30 to 55 inches

Ap horizon:
Chroma—1 or 2
Percent clay—20 to 27

E horizon:
Value—4 to 6
Chroma—3 or 4
Percent clay—20 to 27

Bt horizon:
Value—4 to 6
Chroma—3 or 4
Texture—silty clay loam or silty clay
Percent clay—35 to 45

2Btg or 2BCg horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, silt loam, or loam

2Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—5 or 6
Chroma—1 or 2
Texture—silt loam or loam

Huey Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess or loess and the underlying silty and loamy sediments
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, mesic Typic Natraqualfs
Taxadjunct features: The Huey soils in this county have slightly less than 15 percent exchangeable sodium within a depth of 16 inches. These soils

are classified as fine-silty, mixed, mesic Typic Ochraqualfs.

Typical Pedon

Huey silt loam, 180 feet east and 390 feet south of the northwest corner of sec. 5, T. 3 S., R. 5 W.

Ap—0 to 8 inches; dark gray (10YR 4/1) silt loam, gray (10YR 6/1) dry; moderate fine and medium granular structure; friable; few fine roots; neutral; abrupt smooth boundary.

Eg—8 to 14 inches; dark grayish brown (2.5Y 4/2) silt loam; weak thick platy structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btng1—14 to 22 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine distinct light olive brown (2.5Y 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; many distinct dark gray (5Y 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few fine and medium white concretions of calcium carbonate; moderately alkaline; clear smooth boundary.

Btng2—22 to 30 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine distinct light olive brown (2.5Y 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; many distinct dark gray (5Y 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few fine and medium white concretions of calcium carbonate; moderately alkaline; clear smooth boundary.

Btng3—30 to 43 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine distinct light olive brown (2.5Y 5/4) and few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; many faint dark grayish brown (2.5Y 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few fine and medium white concretions of calcium carbonate; strongly alkaline; clear smooth boundary.

Btng4—43 to 52 inches; light brownish gray (2.5Y 6/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) and few fine distinct light olive brown (2.5Y 5/4) mottles; weak medium prismatic structure; friable; common faint grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few fine white concretions of calcium carbonate; moderately alkaline; clear smooth boundary.

BCkg—52 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; few fine faint grayish brown (2.5Y 5/2), few fine prominent yellowish brown (10YR 5/4), and common fine prominent yellowish brown (10YR 5/6) mottles; weak coarse prismatic structure; friable; few fine rounded accumulations of iron and manganese oxide; few fine white concretions of calcium carbonate; moderately alkaline.

Range in Characteristics

Depth to the natric horizon: 16 inches from the surface; within 6 inches of the upper boundary of the Btg horizon

Percent exchangeable sodium in the natric horizon: 15 to 45

Thickness of the loess: 40 to more than 60 inches

Ap horizon:
Value—4 or 5
Chroma—1 or 2
Percent clay—15 to 27

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 7
Texture—silt loam or silt
Percent clay—11 to 25

Btng or Btg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, silty clay, or silt loam
Percent clay—20 to 43

BCkg, BCg, 2BCkg, or 2BCg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or silty clay loam

Ckg, Cg, 2Ckg, or 2Cg horizon (if it occurs):
Hue—10YR, 7.5YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or silty clay loam (Cg); loam or silt loam (2Cg)

Hurst Series

Depth class: Very deep
Drainage class: Somewhat poorly drained

Permeability: Very slow
Landform: Stream terraces
Position on the landform: Treads
Parent material: Lacustrine sediments or alluvium with a thin mantle of loess
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Aeric Ochraqualfs

Typical Pedon

Hurst silt loam, 0 to 2 percent slopes, rarely flooded, 2,600 feet east and 2,360 feet north of the southwest corner of sec. 7, T. 1 S., R. 4 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine and very fine granular structure; friable; common fine and medium roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—5 to 10 inches; dark grayish brown (10YR 4/2) silt loam; weak thick platy structure; friable; common fine and few medium roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

2Bt1—10 to 14 inches; brown (10YR 5/3) silty clay loam; few fine faint dark yellowish brown (10YR 4/4) mottles; moderate fine and medium subangular blocky structure; friable; few fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; few distinct white (10YR 8/1 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

2Bt2—14 to 23 inches; brown (10YR 5/3) silty clay; common fine faint dark yellowish brown (10YR 4/4) mottles; moderate fine prismatic structure parting to moderate medium and coarse subangular blocky; very firm; few fine roots; many distinct dark yellowish brown (10YR 4/2) clay films on faces of peds; few distinct light gray (10YR 7/2 dry) pockets of silt; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

2Bt3—23 to 32 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate coarse subangular blocky; firm; few very fine roots; many distinct dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

2Btg1—32 to 41 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine and medium prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate coarse subangular blocky; friable; few very fine roots; few distinct dark grayish brown (10YR 4/2) and grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

2Btg2—41 to 49 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine and medium prominent yellowish brown (10YR 5/6) and common fine prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

2Btg3—49 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium and coarse angular blocky structure; firm; many distinct light olive brown (2.5Y 5/4) and olive gray (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; mildly alkaline.

Range in Characteristics

Depth to carbonates: More than 48 inches
Thickness of the loess: Less than 24 inches

Ap or A horizon (if it occurs):
Value—4 or 5
Chroma—2 or 3
Percent clay—20 to 27

E horizon:
Value—4 to 7
Percent clay—18 to 27

2Bt horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—3 or 4
Texture—silty clay loam, silty clay, or clay
Percent clay—35 to 48

2Btg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Texture—silty clay loam, silty clay, or clay
Percent clay—35 to 48

2Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—2

Texture—stratified silty clay loam and silty clay; thin strata of silt loam in some pedons

Marine Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Aeric Albaqualfs

Typical Pedon

Marine silt loam, 0 to 2 percent slopes, 1,200 feet north and 1,460 feet east of the southwest corner of sec. 27, T. 3 S., R. 4 W.

Ap—0 to 5 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate very fine and fine granular structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

E—5 to 14 inches; grayish brown (10YR 5/2) silt loam; common fine faint brown (10YR 5/3) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate thick platy structure parting to moderate fine granular; friable; few fine roots; common distinct white (10YR 8/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; abrupt smooth boundary.

Bt1—14 to 21 inches; brown (10YR 5/3) silty clay loam; few fine faint yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few fine roots; many distinct grayish brown (10YR 5/2) clay films on faces of peds; few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Bt2—21 to 27 inches; brown (10YR 5/3) silty clay loam; few fine faint yellowish brown (10YR 5/4) and few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; many faint grayish brown (10YR 5/2) clay films on faces of peds; few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt3—27 to 36 inches; brown (10YR 5/3) silty clay loam; few fine faint yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; many distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg1—36 to 44 inches; grayish brown (10YR 5/2) silty clay loam; few fine prominent strong brown (7.5YR 4/6), common fine faint brown (10YR 5/3), and few fine distinct yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure; friable; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg2—44 to 54 inches; light gray (2.5Y 7/2) silt loam; common medium prominent strong brown (7.5YR 4/6) and few fine faint yellowish brown (10YR 5/4) mottles; moderate medium prismatic structure; friable; common distinct grayish brown (10YR 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few medium white (5YR 8/1) crystals of barium sulfate on faces of peds; strongly acid; clear smooth boundary.

BCg—54 to 60 inches; light gray (2.5Y 7/2) silt loam; few fine prominent dark yellowish brown (10YR 4/6) and common medium distinct dark gray (10YR 4/1) mottles; weak coarse prismatic structure; friable; few fine rounded accumulations of iron and manganese oxide; few medium white (5YR 8/1) crystals of barium sulfate on faces of peds; slightly acid.

Range in Characteristics

Ap horizon:
Value—4 or 5
Chroma—2 or 3
Texture—silt loam or silt
Percent clay—5 to 18

E horizon:
Value—5 to 7
Chroma—1 or 2
Texture—silt loam or silt
Percent clay—5 to 18

Bt horizon:
Hue—10YR or 2.5Y

Value—4 to 7
Chroma—3 or 4
Texture—silty clay loam or silty clay
Percent clay—35 to 48

Btg or BCg horizon:
Value—4 to 7
Chroma—1 or 2
Texture—silty clay loam or silt loam

Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Texture—silt loam

Morristown Series

Depth class: Very deep
Drainage class: Well drained
Permeability: Moderately slow
Landform: Till plains
Position on the landform: Reconstructed crests, interfluves, and side slopes
Parent material: Rock quarry overburden
Slope range: 3 to 60 percent
Taxonomic classification: Loamy-skeletal, mixed (calcareous), mesic Typic Udorthents

Typical Pedon

Morristown silt loam, 3 to 12 percent slopes, 640 feet west and 610 feet south of the northeast corner of sec. 20, T. 3 S., R. 1 W.

A—0 to 5 inches; dark grayish brown (2.5Y 4/2) silt loam, light brownish gray (2.5Y 6/2) dry; weak fine and medium subangular blocky structure; friable; few fine and very fine roots; about 10 percent sandstone, siltstone, shale, and limestone channers; strong effervescence; moderately alkaline; clear wavy boundary.
C1—5 to 11 inches; mixed yellowish brown (10YR 5/6) and dark gray (5Y 4/1) very channery silty clay loam; massive; friable; few very fine roots; about 40 percent sandstone, siltstone, shale, and limestone channers; strong effervescence; moderately alkaline; gradual wavy boundary.
C2—11 to 44 inches; mixed very dark gray (2.5Y 3/1), brownish yellow (10YR 6/8), and yellowish brown (10YR 5/4) very cobbly silty clay loam; massive; firm; about 45 percent cobblestones and gravel; strong effervescence; moderately alkaline; gradual wavy boundary.
C3—44 to 60 inches; mixed dark gray (2.5Y 4/1), dark yellowish brown (10YR 4/4), and yellowish brown (10YR 5/6) very gravelly silty clay loam; massive; firm; about 35 percent gravel and cobblestones; strong effervescence; moderately alkaline.

Range in Characteristics

Percent fine sand or coarser sand in the control section: 15 or more
Percent rock fragments in the control section: 35 or more by volume

A horizon:
Hue—2.5Y, 10YR, or 7.5YR
Value—4 to 6
Chroma—1 to 8
Texture—silt loam, silty clay loam, clay loam, or loam in reclaimed areas
Percent clay—18 to 35

C horizon:
Hue—7.5YR, 10YR, 2.5Y, 5Y, or neutral
Value—2 to 6
Chroma—0 to 8
Texture—the channery, very channery, gravelly, very gravelly, cobbly, or very cobbly analogs of silty clay loam, clay loam, sandy clay loam, or loam
Percent clay—25 to 35

Muren Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform: Till plains
Position on the landform: Crests, interfluves, side slopes, and head slopes
Parent material: Loess
Slope range: 2 to 10 percent
Taxonomic classification: Fine-silty, mixed, mesic Aquic Hapludalfs

Typical Pedon

Muren silt loam, 2 to 5 percent slopes, 2,380 feet south and 2,440 feet west of the northeast corner of sec. 18, T. 1 S., R. 4 W.

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam, pale brown (10YR 6/3) dry; moderate fine granular structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid; abrupt smooth boundary.
E—7 to 12 inches; brown (10YR 5/3) silt loam; weak thick platy structure parting to moderate fine subangular blocky; friable; few fine roots; few fine

rounded accumulations of iron and manganese oxide; strongly acid; abrupt smooth boundary.

Bt1—12 to 18 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) mottles; moderate fine and medium subangular blocky structure; friable; few fine and very fine roots; few faint brown (10YR 5/3) clay films on faces of peds; few distinct white (10YR 8/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt2—18 to 29 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct dark yellowish brown (10YR 4/6) and few fine prominent light brownish gray (10YR 6/2) mottles; moderate medium and coarse subangular blocky structure; friable; few fine and very fine roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt3—29 to 36 inches; brown (10YR 5/3) silty clay loam; common fine distinct yellowish brown (10YR 5/6) and common fine prominent strong brown (7.5YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; few faint dark yellowish brown (10YR 4/4) and few distinct light brownish gray (2.5Y 6/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt4—36 to 48 inches; yellowish brown (10YR 5/4) silty clay loam; common fine prominent strong brown (7.5YR 5/6) and common fine and medium prominent light brownish gray (2.5Y 6/2) mottles; moderate medium prismatic structure; friable; few very fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

BCg—48 to 54 inches; light brownish gray (2.5Y 6/2) silty clay loam; many fine and medium prominent yellowish brown (10YR 5/6) and common fine prominent strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure; friable; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Cg—54 to 60 inches; mottled light brownish gray (2.5Y 6/2) and yellowish brown (10YR 5/6) silt loam; massive; friable; few fine rounded accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Ap or A horizon (if it occurs):
Value—4 or 5
Chroma—2 to 4
Percent clay—15 to 27

E horizon:
Value—4 or 5
Chroma—3 or 4
Percent clay—15 to 27

Bt horizon:
Value—4 to 6
Chroma—3 to 6
Texture—silty clay loam or silt loam
Percent clay—22 to 30

BCg horizon:
Hue—10YR or 2.5Y
Value—5 or 6
Texture—silty clay loam or silt loam

BC horizon (if it occurs):
Hue—10YR
Value—5 or 6
Chroma—3 to 6
Texture—silty clay loam or silt loam

Cg horizon:
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—2 to 6

C horizon (if it occurs):
Hue—10YR
Value—5 or 6
Chroma—3 to 6
Texture—silt loam

Oconee Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Till plains
Position on the landform: Crests, interfluves, side slopes, head slopes, and broad summits
Parent material: Loess
Slope range: 0 to 5 percent
Taxonomic classification: Fine, montmorillonitic, mesic Udollic Ochraqualfs

Typical Pedon

Oconee silt loam, in an area of Darmstadt-Oconee complex, 0 to 2 percent slopes, 1,500 feet north and

1,280 feet east of the southwest corner of sec. 20, T. 2 S., R. 5 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine and medium granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

E1—8 to 13 inches; dark grayish brown (10YR 4/2) silt loam; moderate thick platy structure; friable; few fine roots; common faint very dark gray (10YR 3/1) organic films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

E2—13 to 19 inches; dark grayish brown (10YR 4/2) silt loam; few fine distinct dark yellowish brown (10YR 4/4) mottles; moderate fine and medium subangular blocky structure; friable; few fine roots; common distinct light gray (10YR 7/1 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt—19 to 24 inches; brown (10YR 4/3) silty clay loam; few fine faint dark yellowish brown (10YR 4/4) mottles; moderate medium subangular blocky structure; firm; few very fine and fine roots; many faint dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Btg1—24 to 35 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) and brown (10YR 4/3) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; many distinct very dark gray (N 3/0) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Btg2—35 to 45 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) and few fine prominent brown (10YR 4/3) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; few distinct very dark gray (N 3/0) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

BCg—45 to 57 inches; grayish brown (2.5Y 5/2) silt loam; common fine prominent yellowish brown (10YR 5/6) and few fine prominent brown (10YR 4/3) mottles; weak medium prismatic structure; friable; few distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Cg—57 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; few fine prominent yellowish brown (10YR 5/6) and grayish brown (10YR 5/2) mottles; massive; friable; few fine rounded accumulations of iron and manganese oxide; medium acid.

Range in Characteristics

Thickness of the loess: More than 55 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2
Percent clay—20 to 27

E horizon:
Value—4 to 6
Chroma—1 or 2
Percent clay—18 to 27

Bt horizon:
Value—4 to 6
Chroma—3 or 4
Texture—silty clay loam or silty clay
Percent clay—35 to 42

Btg and BCg horizons:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6

Cg horizon:
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6

2Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 to 6
Texture—silt loam or loam

Okaw Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Flood plains
Parent material: Lacustrine sediments or alluvium with a thin mantle of loess
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Typic Albaqualfs

Typical Pedon

Okaw silt loam, rarely flooded, 2,400 feet east and 1,500 feet south of the northwest corner of sec. 12, T. 1 S., R. 5 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure parting to moderate fine granular; friable; few fine and medium roots; few fine rounded accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

Eg—6 to 15 inches; grayish brown (10YR 5/2) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; weak thick platy structure parting to moderate fine and medium subangular blocky; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

2Btg1—15 to 23 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine prominent strong brown (7.5YR 6/2) mottles; moderate medium subangular blocky structure; firm; few fine roots; common faint grayish brown (2.5Y 5/2) clay films on faces of peds; common distinct white (10YR 8/1 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

2Btg2—23 to 33 inches; light brownish gray (2.5Y 6/2) silty clay; few fine prominent brown (7.5YR 4/4) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very firm; few fine roots; many faint grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; gradual smooth boundary.

2Btg3—33 to 42 inches; light brownish gray (2.5Y 6/2) silty clay; few fine prominent strong brown (7.5YR 4/6) mottles; moderate medium prismatic structure; very firm; few very fine and fine roots; many distinct light yellowish brown (2.5Y 6/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

2Btg4—42 to 47 inches; light brownish gray (2.5Y 6/2) silty clay loam; many fine prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure; firm; few very fine roots; common distinct light yellowish brown (2.5Y 6/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

2Btg5—47 to 56 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine and medium prominent strong brown (7.5YR 4/6 and 5/6) mottles; weak medium prismatic structure; friable; few very fine roots; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

2Btg6—56 to 60 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6) mottles; weak thick platy structure parting to moderate medium and coarse angular blocky; firm; common faint grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the loess: 8 to 20 inches

Ap or A horizon (if it occurs):
Value—4 or 5
Chroma—1 or 2
Texture—silt loam or silty clay loam
Percent clay—15 to 35

Eg horizon:
Value—4 to 7
Chroma—1 or 2
Texture—silt loam or silty clay loam
Percent clay—15 to 35

BEg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or silty clay loam
Percent clay—20 to 35

2Btg horizon:
Hue—2.5Y or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay, clay, or silty clay loam
Percent clay—40 to 60

2BCg or 2Cg horizon (if it occurs):
Hue—2.5Y or 5Y
Value—4 or 5
Chroma—2
Texture—silty clay, clay, or silty clay loam

Orion Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Flood plains
Position on the landform: Meander scrolls
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents

Typical Pedon

Orion silt loam, frequently flooded, 1,500 feet south and 2,420 feet east of the northwest corner of sec. 5, T. 1 S., R. 2 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; common fine and medium roots; few fine rounded accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

C—7 to 21 inches; grayish brown (10YR 5/2) and brown (10YR 5/3) silt loam; common fine faint grayish brown (2.5Y 5/2) mottles; massive; friable; common fine and medium roots; few fine rounded accumulations of iron and manganese oxide; medium acid; abrupt smooth boundary.

Ab1—21 to 40 inches; very dark gray (10YR 3/1) and black (10YR 2/1) silt loam; weak coarse subangular blocky structure; friable; few medium and common fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Ab2—40 to 60 inches; very dark gray (10YR 3/1) silt loam; few fine faint gray (10YR 5/1) and few fine distinct dark yellowish brown (10YR 4/4) mottles; weak coarse subangular blocky structure; friable; common fine roots; few fine rounded accumulations of iron and manganese oxide; slightly acid.

Range in Characteristics

Depth to Ab horizon: 20 to 40 inches

Ap or A horizon (if it occurs):
Value—4 or 5
Chroma—2 or 3
Percent clay—10 to 18

C horizon:
Value—4 or 5
Texture—silt loam; thin strata of very fine loamy sand, very fine sandy loam, or loam in some pedons
Percent clay—10 to 18

Ab horizon:
Chroma—1 or 2
Texture—silt loam or silty clay loam
Percent clay—10 to 30

Cg horizon (if it occurs):
Hue—10YR or 2.5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

Petrolia Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Flood plains
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, nonacid, mesic Typic Fluvaquents

Typical Pedon

Petrolia silty clay loam, frequently flooded, 1,800 feet west and 600 feet north of the southeast corner of sec. 6, T. 1 S., R. 4 W.

Ap1—0 to 4 inches; very dark gray (10YR 3/1) silty clay loam, gray (10YR 5/1) dry; weak medium granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

Ap2—4 to 9 inches; dark gray (10YR 4/1) silty clay loam, light gray (10YR 6/1) dry; common medium distinct yellowish brown (10YR 5/4) mottles; weak medium subangular blocky structure; friable; common fine roots; many distinct dark grayish brown (2.5Y 4/2) linings along root channels; slightly acid; clear smooth boundary.

ACg—9 to 16 inches; dark gray (10YR 4/1) silty clay loam, light gray (10YR 6/1) dry; few fine distinct yellowish brown (10YR 5/4) mottles; moderate medium and coarse subangular blocky structure; friable; few fine roots; many distinct dark grayish brown (2.5Y 4/2) linings along root channels; slightly acid; clear smooth boundary.

Cg1—16 to 28 inches; dark gray (10YR 4/1) silty clay loam; common fine distinct yellowish brown (10YR 5/4) mottles; weak medium and coarse subangular blocky structure; friable; few very fine

and fine roots; few distinct white (10YR 8/1 dry) silt coatings on faces of peds; many distinct dark gray (5Y 4/1) linings along root channels; few fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

Cg2—28 to 50 inches; dark gray (10YR 4/1) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium and coarse subangular blocky structure; friable; few very fine roots; many distinct dark gray (5Y 4/1) linings along root channels; few fine rounded accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

Cg3—50 to 60 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; massive; friable; few very fine roots; many distinct dark gray (5Y 4/1) linings along root channels; few fine rounded accumulations of iron and manganese oxide; medium acid.

Range in Characteristics

Ap or A horizon (if it occurs):
Hue—10YR or 2.5Y
Texture—silty clay loam or silt loam
Percent clay—25 to 35

Cg horizon:
Value—4 to 6
Chroma—0 to 2
Texture—dominantly silty clay loam; subhorizons of silt loam in some pedons
Percent clay—20 to 35

Piasa Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Mollic Natraqualfs
Taxadjunct features: The Piasa soil in map unit 941 has a mollic epipedon, which is not typical for the series. This soil is classified as fine, montmorillonitic, mesic Typic Natraquolls.

Typical Pedon

Piasa silt loam, 510 feet south and 800 feet east of the northwest corner of sec. 27, T. 2 S., R. 5 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate very fine and fine granular structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Eg—8 to 11 inches; dark gray (10YR 4/1) silt loam; moderate thick platy structure; friable; few very fine roots; common faint (10YR 3/1) organic films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Btkg1—11 to 17 inches; dark grayish brown (2.5Y 4/2) silty clay loam; few fine distinct brown (10YR 5/3) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; many distinct very dark grayish brown (10YR 3/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few fine and medium concretions of calcium carbonate; moderately alkaline; clear smooth boundary.

Btkg2—17 to 23 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few very fine roots; common distinct very dark grayish brown (10YR 3/2) and many distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few fine and medium concretions of calcium carbonate; moderately alkaline; clear smooth boundary.

Btkg3—23 to 30 inches; grayish brown (2.5Y 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; few distinct very dark grayish brown (10YR 3/2) and many distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few fine and medium concretions of calcium carbonate; moderately alkaline; clear smooth boundary.

Btkg4—30 to 37 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few fine and medium

concretions of calcium carbonate; moderately alkaline; clear smooth boundary.

Btkg5—37 to 45 inches; grayish brown (2.5Y 5/2) silty clay loam; common fine prominent light yellowish brown (10YR 6/4) and few fine prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; few distinct dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; few fine and medium concretions of calcium carbonate; moderately alkaline; clear smooth boundary.

BCg—45 to 55 inches; grayish brown (2.5Y 5/2) silt loam; few fine prominent yellowish brown (10YR 5/6) and many medium prominent light yellowish brown (10YR 6/4) mottles; weak coarse prismatic structure; friable; few distinct gray (10YR 5/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; mildly alkaline; gradual smooth boundary.

Cg—55 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common fine prominent light yellowish brown (10YR 6/4) and few fine prominent yellowish brown (10YR 5/6) mottles; massive; friable; few fine rounded accumulations of iron and manganese oxide; mildly alkaline.

Range in Characteristics

Depth to the natric horizon: 16 inches from the surface; within 6 inches of the upper boundary of the Btkg or Btg horizon

Percent exchangeable sodium in the natric horizon: 15 or more

Thickness of the loess: More than 55 inches

Ap horizon:
Value—2 or 3
Chroma—1 or 2
Percent clay—18 to 27

Eg horizon:
Value—4 or 5
Chroma—1 or 2
Percent clay—18 to 27

Btkg or Btg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay
Percent clay—35 to 43

BCg or BCkg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or silty clay loam

Cg, Ckg, 2Cg, or 2Ckg horizon (if it occurs):
Hue—10YR, 2.5Y, 5Y, or neutral
Value—4 to 6
Chroma—0 to 2

Racoon Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Slow
Landform: Flood plains
Parent material: Loess and silty alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Fine-silty, mixed, mesic Typic Ochraqualfs

Typical Pedon

Racoon silt loam, occasionally flooded, 560 feet south and 3,120 feet west of the northeast corner of sec. 18, T. 1 S., R. 4 W.

Ap—0 to 9 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; moderate fine and medium granular structure; friable; few fine roots; neutral; abrupt smooth boundary.

Eg1—9 to 17 inches; grayish brown (10YR 5/2) and dark grayish brown (10YR 4/2) silt loam; few fine distinct yellowish brown (10YR 5/6) and common fine faint gray (10YR 5/1) mottles; moderate thick platy structure; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Eg2—17 to 30 inches; gray (10YR 5/1) and dark grayish brown (10YR 4/2) silt loam; few fine distinct yellowish brown (10YR 5/6) and few fine faint grayish brown (10YR 5/2) mottles; moderate thin platy structure; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Eg3—30 to 34 inches; gray (10YR 5/1) silt loam; few fine distinct yellowish brown (10YR 5/6) and common fine faint light gray (10YR 6/1) mottles; weak thin platy structure; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg1—34 to 41 inches; light brownish gray (10YR 6/2) silty clay loam; few fine distinct yellowish brown (10YR 5/4 and 5/6) mottles; moderate medium prismatic structure parting to moderate medium

subangular blocky; firm; many distinct gray (10YR 5/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Btg2—41 to 48 inches; light brownish gray (10YR 6/2) silty clay loam; few fine distinct yellowish brown (10YR 5/4 and 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; many distinct gray (10YR 5/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Btg3—48 to 54 inches; light gray (10YR 6/1) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure; friable; common faint gray (10YR 5/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Cg—54 to 60 inches; gray (10YR 5/1) silty clay loam; common medium prominent yellowish brown (10YR 5/6), many medium prominent yellowish brown (10YR 5/8), and few fine faint light gray (10YR 6/1) mottles; massive; firm; few fine rounded accumulations of iron and manganese oxide; medium acid.

Range in Characteristics

Depth to the Btg horizon: 24 to 36 inches

Ap horizon:
Value—4 to 6
Percent clay—20 to 27

Eg horizon:
Hue—10YR or 2.5Y
Value—4 to 7
Percent clay—18 to 25

Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—5 to 7
Percent clay—27 to 35

Cg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 7
Chroma—1 or 2
Texture—silty clay loam or silt loam; strata of very fine sandy loam to silty clay in some pedons

Richview Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform: Till plains
Position on the landform: Crests and side slopes
Parent material: Loess and the underlying silty and loamy sediments
Slope range: 2 to 10 percent
Taxonomic classification: Fine-silty, mixed, mesic Mollic Hapludalfs

Typical Pedon

Richview silt loam, 2 to 5 percent slopes, 2,500 feet north and 2,380 feet west of the southeast corner of sec. 6, T. 2 S., R. 1 W.

Ap—0 to 8 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; few fine and medium roots; neutral; abrupt smooth boundary.

E—8 to 13 inches; dark grayish brown (10YR 4/2) silt loam; common fine prominent strong brown (7.5YR 4/6) mottles; weak thick platy structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt1—13 to 21 inches; yellowish brown (10YR 5/4) silty clay loam; many prominent yellowish red (5YR 4/6) mottles; moderate medium subangular blocky structure; firm; few fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt2—21 to 28 inches; yellowish brown (10YR 5/4) silty clay loam; few fine distinct yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine and fine roots; common faint brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt3—28 to 33 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct dark yellowish brown (10YR 4/6) and few fine distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common faint

brown (10YR 4/3) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

Bt4—33 to 42 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct dark yellowish brown (10YR 4/6) and common medium distinct grayish brown (10YR 5/2) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; clear smooth boundary.

2Bt5—42 to 51 inches; strong brown (7.5YR 5/6) silt loam; common fine prominent grayish brown (2.5Y 5/2) and light yellowish brown (10YR 6/4) mottles; weak medium prismatic structure; friable; common prominent dark yellowish brown (10YR 3/4) clay films on faces of peds; common very fine sand and fine sand visible on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid; gradual smooth boundary.

2BC—51 to 60 inches; strong brown (7.5YR 5/6) silt loam; common fine prominent grayish brown (2.5Y 5/2) mottles; weak medium prismatic structure; friable; common very fine sand and fine sand visible on faces of peds; few fine rounded accumulations of iron and manganese oxide; slightly acid.

Range in Characteristics

Thickness of the loess: 30 to 55 inches

Ap horizon:
Value—2 or 3
Chroma—1 to 3
Percent clay—20 to 27

E horizon:
Value—4 or 5
Chroma—2 or 3
Percent clay—20 to 27

Bt horizon:
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Percent clay—25 to 35

2Bt or 2BC horizon:
Value—4 to 6
Chroma—3 to 6
Texture—silt loam, loam, or clay loam

2C horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—2 to 4
Texture—loam, clay loam, or silt loam

Rushville Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Typic Albaqualfs

Typical Pedon

Rushville silt loam, 900 feet south and 410 feet west of the northeast corner of sec. 30, T. 3 S., R. 3 E.

Ap1—0 to 6 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; moderate very fine and fine granular structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Ap2—6 to 10 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; weak medium subangular blocky structure parting to weak very fine and fine granular; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Eg—10 to 16 inches; light brownish gray (10YR 6/2) silt loam; few fine prominent dark grayish brown (10YR 4/4) mottles; moderate thick platy structure; friable; few very fine roots; common distinct light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; abrupt smooth boundary.

B/Eg—16 to 20 inches; grayish brown (2.5Y 5/2) silt loam (B); light gray (10YR 7/2) silt (Eg); the Eg material occurs as many prominent dry coatings on faces of peds and as fillings in spaces between peds; few fine prominent dark yellowish brown (10YR 4/4) and common fine distinct grayish brown (10YR 5/2) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; extremely acid; clear smooth boundary.

Btg1—20 to 27 inches; grayish brown (2.5Y 5/2) silty clay; few fine prominent dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; extremely acid; clear smooth boundary.

Btg2—27 to 35 inches; grayish brown (2.5Y 5/2) silty clay; few fine prominent dark yellowish brown (10YR 4/4) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; common distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; extremely acid; clear smooth boundary.

Btg3—35 to 45 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent dark yellowish brown (10YR 4/4 and 4/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; common distinct light gray (10YR 7/2 dry) pockets of silt; few fine rounded accumulations of iron and manganese oxide; extremely acid; clear smooth boundary.

Btg4—45 to 55 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/6) and few fine distinct grayish brown (10YR 5/2) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few distinct dark grayish brown (10YR 4/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

BCg—55 to 60 inches; grayish brown (2.5Y 5/2) silt loam; few fine prominent yellowish brown (10YR 5/6) and few fine distinct grayish brown (10YR 5/2) mottles; weak medium prismatic structure; friable; few fine rounded accumulations of iron and manganese oxide; strongly acid.

Range in Characteristics

Ap horizon:
Value—4 or 5
Chroma—1 or 2
Percent clay—15 to 27

Eg horizon:
Value—5 or 6
Chroma—1 or 2
Texture—silt loam or silt
Percent clay—10 to 22

Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Percent clay—35 to 45

BCg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silt loam

Cg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam

Stoy Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Slow
Landform: Till plains
Position on the landform: Crests, interfluves, side slopes, head slopes, and broad summits
Parent material: Loess
Slope range: 0 to 10 percent
Taxonomic classification: Fine-silty, mixed, mesic Aquic Hapludalfs

Typical Pedon

Stoy silt loam, 0 to 2 percent slopes, 2,653 feet east and 521 feet south of the northwest corner of sec. 9, T. 5 S., R. 6 W.

Ap—0 to 7 inches; dark brown (10YR 4/3) silt loam, light yellowish brown (10YR 6/4) dry; moderate medium granular structure; friable; many fine, medium, and coarse roots; neutral; abrupt smooth boundary.

E—7 to 12 inches; brown (10YR 5/3) silt loam; moderate thick platy structure parting to moderate medium and fine subangular blocky; friable; many fine, medium, and coarse roots; slightly acid; clear smooth boundary.

BE—12 to 18 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; many fine, medium, and coarse roots; common distinct very pale brown (10YR 8/3 dry) silt coatings on faces of peds; very strongly acid; clear smooth boundary.

Bt1—18 to 22 inches; yellowish brown (10YR 5/4) silt loam; few fine distinct grayish brown (10YR 5/2) and common fine distinct yellowish brown (10YR 5/8) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common fine and medium roots; common distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few distinct very pale brown (10YR 8/3 dry) silt coatings on faces of peds; few fine and medium rounded accumulations of iron and manganese oxide; very strongly acid; clear wavy boundary.

Bt2—22 to 27 inches; yellowish brown (10YR 5/4) silty clay loam; common medium distinct yellowish brown (10YR 5/8) mottles; weak fine prismatic structure parting to moderate medium subangular blocky; firm; common fine and medium roots; common distinct dark yellowish brown clay films on faces of peds; many prominent light gray (10YR 7/2 dry) silt coatings on faces of peds; few fine and medium rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Bt3—27 to 38 inches; grayish brown (10YR 5/2) silty clay loam; common fine distinct yellowish brown (10YR 5/8) and dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; common fine and medium roots; many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; common distinct light yellowish brown (10YR 6/4 dry) silt coatings on faces of peds; few fine and medium rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Btx—38 to 45 inches; grayish brown (10YR 5/2) silty clay loam; common medium prominent yellowish brown (10YR 5/8) and common medium distinct dark yellowish brown (10YR 4/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; very firm; brittle in part of the mass; common fine and medium roots; common distinct dark grayish brown (10YR 4/2) and many distinct dark yellowish brown (10YR 4/4) clay films on faces of peds; few distinct light yellowish brown (10YR 6/4 dry) silt coatings on faces of peds; few fine and medium rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

BC—45 to 53 inches; yellowish brown (10YR 5/4) silty clay loam; many medium distinct yellowish brown (10YR 5/8), dark yellowish brown (10YR 4/6), and grayish brown (10YR 5/2) mottles; weak coarse subangular blocky structure; firm; few fine roots; few faint dark yellowish brown (10YR 4/4) clay films on faces of peds; few distinct light brownish gray (10YR 6/2 dry) silt coatings on faces of peds; few fine and medium rounded accumulations of iron and manganese oxide; strongly acid; gradual wavy boundary.

C—53 to 60 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct yellowish brown (10YR 5/8), dark yellowish brown (10YR 4/6), and grayish brown (10YR 5/2) mottles; massive; friable; very few fine roots; common fine and medium rounded accumulations of iron and manganese oxide; strongly acid.

Range in Characteristics

Ap horizon:
Chroma—2 or 3
Percent clay—20 to 27

E horizon:
Percent clay—20 to 27

Bt horizon:
Value—4 to 6
Chroma—2 to 4
Percent clay—27 to 35

Virden Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Moderately slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Typic Argiaquolls

Typical Pedon

Virden silt loam, 1,700 feet north and 2,480 feet east of the southwest corner of sec. 13, T. 1 S., R. 3 W.

Ap—0 to 8 inches; very dark gray (10YR 3/1) silt loam, gray (10YR 5/1) dry; moderate fine and medium granular structure; friable; common fine and medium roots; neutral; abrupt smooth boundary.

A—8 to 14 inches; black (10YR 2/1) silty clay loam, dark gray (10YR 4/1) dry; moderate fine angular blocky structure; friable; few fine and medium roots; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Bt—14 to 22 inches; very dark gray (10YR 3/1) silty clay loam, dark gray (10YR 4/1) dry; few fine distinct brown (10YR 4/3) mottles; moderate medium angular blocky structure; firm; few fine and medium roots; many faint very dark gray (10YR 3/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btg1—22 to 33 inches; dark grayish brown (2.5Y 4/2) silty clay; few fine prominent yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; many distinct very dark gray (10YR 3/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; clear smooth boundary.

Btg2—33 to 42 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/8) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; firm; few fine roots; many distinct very dark gray (N 3/0) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

Btg3—42 to 54 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent yellowish brown (10YR 5/8) and few fine distinct brown (10YR 5/3) mottles; moderate medium prismatic structure parting to weak medium subangular blocky; firm; few fine roots; many distinct very dark gray (N 3/0) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral; gradual smooth boundary.

BCg—54 to 60 inches; light brownish gray (2.5Y 6/2) silt loam; common fine prominent yellowish brown (10YR 5/8) and few fine distinct brown (10YR 5/3) mottles; weak medium prismatic structure; friable; few fine roots; few distinct dark gray (N 4/0) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; neutral.

Range in Characteristics

Thickness of the mollic epipedon: 12 to 24 inches

Ap or A horizon:
Value—2 or 3
Chroma—1 or 2
Texture—silt loam or silty clay loam
Percent clay—25 to 30

Bt horizon:
Hue—10YR, 5Y, or neutral
Value—2 or 3
Chroma—0 to 2
Texture—silty clay loam or silty clay
Percent clay—35 to 42

Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Percent clay—35 to 42

BCg or Cg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silt loam or silty clay loam

Wakeland Series

Depth class: Very deep
Drainage class: Somewhat poorly drained
Permeability: Moderate
Landform: Flood plains
Position on the landform: Meander scrolls
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents

Typical Pedon

Wakeland silt loam, frequently flooded, 840 feet east and 1,400 feet south of the northwest corner of sec. 25, T. 1 N., R. 2 W.

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) silt loam, light gray (10YR 7/2) dry; moderate fine granular structure; friable; common fine roots; few fine rounded accumulations of iron and manganese oxide; neutral; abrupt smooth boundary.

Cg1—7 to 12 inches; grayish brown (10YR 5/2) silt loam; few fine distinct dark yellowish brown (10YR 4/4) and common fine faint dark grayish brown (10YR 4/2) mottles; massive; friable; common fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid; clear smooth boundary.

Cg2—12 to 24 inches; grayish brown (10YR 5/2) silt loam; few fine distinct dark yellowish brown (10YR 4/6) and common fine faint gray (10YR 6/1) mottles; massive; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

Cg3—24 to 37 inches; light brownish gray (10YR 6/2)

silt loam; common fine distinct dark yellowish brown (10YR 4/6) and common fine faint grayish brown (10YR 5/2) mottles; massive; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

Cg4—37 to 48 inches; light brownish gray (10YR 6/2) silt loam; few fine distinct dark yellowish brown (10YR 4/6) and few fine faint grayish brown (10YR 5/2) mottles; massive; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid; gradual smooth boundary.

Cg5—48 to 60 inches; grayish brown (10YR 5/2) silt loam; few fine distinct light yellowish brown (10YR 6/4) and few fine faint light brownish gray (10YR 6/2) mottles; massive; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid.

Range in Characteristics

Ap horizon:
Value—4 or 5
Chroma—2 or 3
Percent clay—10 to 17

C horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—3 or 4
Texture—silt loam
Percent clay—10 to 17

Cg horizon:
Hue—10YR or 2.5Y
Chroma—1 or 2
Texture—silt loam; silt loam with thin layers ranging from loam to very fine loamy sand in some pedons below a depth of 40 inches
Percent clay—10 to 17

Weir Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Typic Ochraqualfs

Typical Pedon

Weir silt loam, 280 feet south and 1,560 feet west of the northeast corner of sec. 18, T. 5 S., R. 4 W.

Ap—0 to 5 inches; grayish brown (10YR 5/2) silt loam, light brownish gray (10YR 6/2) dry; common medium faint brown (10YR 5/3) and common medium distinct yellowish brown (10YR 5/4) mottles; weak fine and medium granular structure; friable; common very fine roots; common fine and medium rounded accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

Eg1—5 to 10 inches; light brownish gray (10YR 6/2) silt loam; common fine distinct dark yellowish brown (10YR 4/6) and brownish yellow (10YR 6/8) mottles; weak thick platy structure parting to weak fine and medium subangular blocky; friable; few very fine roots; common fine rounded accumulations of iron and manganese oxide; slightly acid; abrupt smooth boundary.

Eg2—10 to 14 inches; light brownish gray (2.5Y 6/2) silt loam; common fine prominent yellowish brown (10YR 5/8) mottles; moderate fine and medium subangular blocky structure; friable; few very fine roots; many distinct white (10YR 8/1 dry) silt coatings on faces of peds; common fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Btg1—14 to 24 inches; grayish brown (2.5Y 5/2) silty clay loam; few fine prominent dark yellowish brown (10YR 4/6) and common medium prominent yellowish brown (10YR 5/6) mottles; moderate medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; many distinct dark grayish brown (2.5Y 4/2) clay films on faces of peds; few prominent white (10YR 8/1 dry) silt coatings on faces of peds; common fine and medium rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Btg2—24 to 32 inches; light brownish gray (2.5Y 6/2) silty clay loam; few fine prominent dark yellowish brown (10YR 4/6) and common medium prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; firm; few very fine roots; common distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few prominent white (10YR 8/1 dry) silt coatings on faces of peds; common fine and medium rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Btg3—32 to 42 inches; light brownish gray (2.5Y 6/2) silty clay loam; common medium prominent yellowish brown (10YR 5/6) mottles; weak medium prismatic structure parting to weak

medium and coarse subangular blocky; firm; few distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few prominent white (10YR 8/1 dry) silt coatings on faces of peds; common fine and medium rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

BCg—42 to 47 inches; light brownish gray (2.5Y 6/2) silty clay loam; many medium and coarse prominent yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) mottles; weak coarse prismatic structure; friable; few prominent white (10YR 8/1 dry) silt coatings on faces of peds; common fine and medium rounded accumulations of iron and manganese oxide; very strongly acid; gradual smooth boundary.

Cg—47 to 60 inches; grayish brown (10YR 5/2) silt loam; common medium prominent yellowish brown (10YR 5/8) and strong brown (7.5YR 5/8) and common medium distinct dark yellowish brown (10YR 4/6) mottles; massive; friable; common fine rounded accumulations of iron and manganese oxide; strongly acid.

Range in Characteristics

Ap horizon:
Value—4 or 5
Percent clay—12 to 27

Eg horizon:
Value—5 or 6
Chroma—1 or 2
Percent clay—12 to 20

Btg horizon:
Hue—10YR or 2.5Y
Percent clay—35 to 40

Wellston Series

Depth class: Deep
Drainage class: Well drained
Permeability: Moderate
Landform: Till plains
Position on the landform: Side slopes and back slopes
Parent material: Loess and glacial drift over material weathered from sandstone or siltstone
Slope range: 18 to 60 percent
Taxonomic classification: Fine-silty, mixed, mesic Ultic Hapludalfs
Taxadjunct features: The Wellston soils in this county have a higher base saturation immediately above the paralithic contact than is defined as the range for the series. Also, the Wellston soil in map unit 900G contains more fine sand or coarser sand in the control section. The Wellston soil in map unit 900E is classified as fine-silty, mixed, mesic Typic Hapludalfs, and that in map unit 900G is classified as fine-loamy, mixed, mesic Typic Hapludalfs.

Typical Pedon

Wellston silt loam, in an area of Hickory-Wellston complex, 18 to 30 percent slopes, 80 feet east and 500 feet north of the southwest corner of sec. 28, T. 3 S., R. 4 W.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) silt loam, grayish brown (10YR 5/2) dry; moderate fine granular structure; friable; many fine and medium roots; medium acid; clear smooth boundary.

E—5 to 9 inches; yellowish brown (10YR 5/4) silt loam; weak thick platy structure parting to weak fine subangular blocky; friable; common fine and medium roots; medium acid; clear smooth boundary.

Bt1—9 to 16 inches; brownish yellow (10YR 6/6) silt loam; moderate fine and medium subangular blocky structure; friable; common fine roots; few distinct yellowish brown (10YR 5/4) clay films on faces of peds; very strongly acid; clear smooth boundary.

Bt2—16 to 22 inches; brownish yellow (10YR 6/6) silt loam; moderate medium subangular blocky structure; friable; few fine roots; common distinct yellowish brown (10YR 5/4) clay films on faces of peds; extremely acid; clear smooth boundary.

2Bt3—22 to 27 inches; brownish yellow (10YR 6/6) silt loam; moderate medium and coarse subangular blocky structure; friable; few fine roots; common distinct brown (7.5YR 5/4) clay films on faces of peds; few distinct very pale brown (10YR 8/4 dry) silt coatings on faces of peds; few pebbles; extremely acid; clear smooth boundary.

2Bt4—27 to 40 inches; light yellowish brown (10YR 6/4) silt loam; common fine prominent strong brown (7.5YR 5/6) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct brown (7.5YR 5/4) clay films on faces of peds; common distinct white (10YR 8/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; few pebbles; few sandstone channers; extremely acid; clear smooth boundary.

2BC—40 to 47 inches; brown (10YR 5/3) loam; common fine prominent reddish yellow (7.5YR

6/8) and strong brown (7.5YR 5/8) mottles; weak medium prismatic structure parting to moderate medium subangular blocky; friable; few very fine roots; common distinct white (10YR 8/2 dry) silt coatings on faces of peds; few fine rounded accumulations of iron and manganese oxide; few pebbles; few sandstone channers; strongly acid; abrupt irregular boundary.

3Cr—47 to 60 inches; reddish yellow (7.5YR 6/8) and pale yellow (5Y 7/3), soft, weathered sandstone with pockets of pale brown (10YR 6/3) loam in cracks; slightly acid.

Range in Characteristics

Depth to bedrock: 40 to 72 inches
Thickness of the loess: Less than 28 inches

A horizon:
Value—3 or 4
Chroma—1 or 2
Percent clay—13 to 27

E horizon:
Value—4 to 6
Chroma—3 or 4
Percent clay—13 to 27

BE horizon (if it occurs):
Hue—10YR or 7.5YR
Value—4 or 5
Chroma—3 to 6
Texture—silt loam
Percent clay—18 to 27

Bt horizon:
Hue—10YR or 7.5YR
Value—4 to 6
Chroma—3 to 8
Texture—silt loam or silty clay loam
Percent clay—18 to 35

2Bt or 2BC horizon:
Hue—7.5YR, 10YR, or 2.5Y
Value—4 to 6
Chroma—3 to 6
Texture—silt loam, silty clay loam, loam, or clay loam or the channery or very channery analogs of these textures

3Cr horizon:
Hue—7.5YR, 10YR, 2.5Y, or 5Y
Value—4 to 7
Chroma—3 to 8
Texture—soft, weathered sandstone or siltstone

3R layer (if it occurs):
Kind of bedrock—hard sandstone or siltstone

Wilbur Series

Depth class: Very deep
Drainage class: Moderately well drained
Permeability: Moderate
Landform: Flood plains
Position on the landform: Meander scrolls
Parent material: Silty alluvium
Slope range: 0 to 2 percent
Taxonomic classification: Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents

Typical Pedon

Wilbur silt loam, frequently flooded, 1,780 feet north and 1,680 feet west of the southeast corner of sec. 16, T. 3 S., R. 2 W.

Ap—0 to 8 inches; brown (10YR 4/3) and dark grayish brown (10YR 4/2) silt loam, very pale brown (10YR 7/3) and light brownish gray (10YR 6/2) dry; few fine faint dark yellowish brown (10YR 4/4) mottles; moderate fine granular structure; friable; common fine roots; neutral; abrupt smooth boundary.

C1—8 to 13 inches; brown (10YR 4/3) silt loam; few fine distinct dark yellowish brown (10YR 4/6) and common fine faint dark yellowish brown (10YR 4/4) mottles; weak fine subangular blocky structure; friable; few very fine and fine roots; neutral; clear smooth boundary.

C2—13 to 19 inches; brown (10YR 4/3) silt loam; common fine distinct dark gray (10YR 4/1) and few fine distinct dark yellowish brown (10YR 4/6) mottles; weak fine subangular blocky structure; friable; few very fine and fine roots; slightly acid; clear smooth boundary.

C3—19 to 33 inches; brown (10YR 4/3) silt loam; common medium faint grayish brown (10YR 5/2) and few fine faint yellowish brown (10YR 5/4) mottles; massive; friable; few very fine roots; medium acid; clear smooth boundary.

C4—33 to 60 inches; brown (10YR 5/3) silt loam; common medium distinct grayish brown (2.5Y 5/2) and few fine faint dark yellowish brown (10YR 4/4) mottles; massive; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; medium acid.

Range in Characteristics

Ap or A horizon:
Value—4 or 5
Chroma—2 to 4
Percent clay—10 to 17

C horizon:
Value—4 to 6
Chroma—3 to 6
Texture—silt loam or silt loam with thin layers of loam or very fine sandy loam
Percent clay—10 to 17

Cg horizon (if it occurs):
Hue—10YR
Value—4 to 6
Chroma—2
Texture—silt loam or silt loam with thin layers of loam or very fine sandy loam
Percent clay—10 to 17

Wynoose Series

Depth class: Very deep
Drainage class: Poorly drained
Permeability: Very slow
Landform: Till plains
Position on the landform: Broad summits
Parent material: Loess and the underlying silty and loamy sediments
Slope range: 0 to 2 percent
Taxonomic classification: Fine, montmorillonitic, mesic Typic Albaqualfs

Typical Pedon

Wynoose silt loam, 2,520 feet south and 280 feet west of the northeast corner of sec. 25, T. 3 S., R. 1 W.

Ap—0 to 8 inches; grayish brown (10YR 5/2) silt loam, light brownish gray (10YR 6/2) dry; moderate fine granular structure; friable; common fine roots; slightly acid; abrupt smooth boundary.

Eg1—8 to 15 inches; light brownish gray (2.5Y 6/2) silt loam; common fine and medium prominent strong brown (7.5YR 4/6 and 5/6) mottles; moderate thick platy structure parting to moderate medium subangular blocky; friable; few fine roots; very strongly acid; clear smooth boundary.

Eg2—15 to 21 inches; light brownish gray (2.5Y 6/2) silt loam; common fine and medium prominent strong brown (7.5YR 4/6 and 5/6) mottles; moderate thick platy structure; friable; few fine roots; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Btg1—21 to 31 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; friable; few very fine and fine roots; common faint grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; very strongly acid; clear smooth boundary.

Btg2—31 to 37 inches; light brownish gray (2.5Y 6/2) silty clay loam; common fine prominent yellowish brown (10YR 5/6) mottles; moderate medium subangular blocky structure; firm; few very fine roots; common fine distinct grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg3—37 to 49 inches; light brownish gray (2.5Y 6/2) silty clay loam; few fine prominent strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few faint grayish brown (2.5Y 5/2) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; clear smooth boundary.

Btg4—49 to 54 inches; light brownish gray (2.5Y 6/2) silty clay loam; few fine prominent strong brown (7.5YR 5/6 and 5/8) mottles; moderate medium subangular blocky structure; friable; few very fine roots; few prominent dark gray (10YR 4/1) clay films on faces of peds; few fine rounded accumulations of iron and manganese oxide; strongly acid; abrupt smooth boundary.

2BCg—54 to 60 inches; gray (5Y 5/1) silt loam; few fine prominent yellowish brown (10YR 5/8) mottles; weak coarse subangular blocky structure; friable; few very fine roots; few fine rounded accumulations of iron and manganese oxide; common distinct black (5Y 2/1) krotovina streaks along faces of peds; few distinct black (2.5Y 2.5/1) organic fillings in root channels; common very fine sand and fine sand visible on faces of peds; medium acid.

Range in Characteristics

Thickness of the loess: 30 to 55 inches

Ap horizon:
Value—4 to 6
Chroma—1 or 2
Percent clay—15 to 25

Eg horizon:
Hue—10YR or 2.5Y
Value—5 to 7
Chroma—1 or 2
Percent clay—12 to 18

Btg horizon:
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam or silty clay
Percent clay—35 to 42

2BCg or 2Btg horizon (if it occurs):
Hue—10YR, 2.5Y, or 5Y
Value—4 to 6
Chroma—1 or 2
Texture—silty clay loam, loam, or silt loam

Formation of the Soils

Soils are a product of the environment in which they formed. They are the result of interactions between five soil-forming processes (Jenny, 1941). The characteristics of a soil at any given time are determined by the physical, chemical, and mineralogical composition of the parent material; the climate under which the soil material has accumulated and existed since accumulation; the type of plant and animal life on and in the soil; the relief, or lay of the land (topography); and the time during which the soil-forming factors have acted on the soil material. Climate, vegetation, and animal life are active factors of soil formation. They act on the parent material that has accumulated through the weathering of rocks that may have been relocated by water, glaciers, or wind, slowly changing it to a natural body that has genetically related horizons. The effects of climate, vegetation, and animal life are conditioned by relief. The parent material also affects the kind of soil profile that forms and in some cases is the strongest factor. Time is needed to change the parent material into a soil profile. The five factors of soil formation are closely interrelated. The effect of one factor cannot be determined unless conditions are specified for the other factors.

Parent Material

Parent material is the unconsolidated geologic material in which soil forms. To a large extent it also determines the rate of soil formation. The soils in Washington County formed in loess, glacial till, alluvium, lacustrine sediments, and residuum, or material weathered from bedrock.

Loess, or wind-deposited silty material, is the most extensive parent material in the county. It blankets many of the other parent materials. In most areas the loess generally occurs as two layers (Fehrenbacher, 1973). The upper layer, or Peoria Loess, was deposited during the Woodfordian Substage of the Wisconsinan Age, about 22,000 to 12,500 years ago. Underlying the Peoria Loess is Roxana Silt. The Roxana Silt was deposited more than 28,000 years ago during the Altonian Substage. It is generally less permeable and more dense and has a redder hue than the Peoria Loess, which generally has a brownish hue.

The loess on summits in the western part of the county is generally more than 60 inches thick. Marine, Oconee, and Rushville soils are examples of soils in these areas. The loess on summits in the eastern part of the county is generally about 30 to 55 inches thick. Bluford, Hoyleton, and Wynoose soils are examples of soils in this area.

Glacial till is material laid down directly by glaciers with very little water action. In Washington County the glacial till was deposited during the Illinoian glacial period more than 125,000 years ago (Willman and others, 1975). It consists of a mixture of clay, silt, sand, and gravel. Hickory soils formed in glacial till with a thin mantle of loess. In some areas the Sangamon Soil, a paleosol that formed about 75,000 years ago, is in the surface layer of the glacial till. Atlas soils are in these areas.

Alluvium is sediment deposited on flood plains by streams and rivers. Most alluvial sediments in the county are silty and are of Holocene age (less than 7,000 years ago) (Willman and others, 1975). The textures of alluvial soils are primarily determined by the velocity of the water at the time of deposition. Soils on the flood plains in the county that have silt loam textures, such as Wakeland soils, generally are in areas closer to the stream channel, where velocity of the floodwater is greater. Soils on the flood plains that have silty clay loam textures, such as Petrolia soils, generally are in areas farther from the stream channel, where the velocity is slower.

Lacustrine sediments consist of deposits of fine textured material that settled out in slackwater areas on stream terraces. The sediments in the county are Wisconsinan (about 75,000 to 7,000 years ago) in age and have a thin mantle of loess (Willman and others, 1975). Hurst and Okaw soils formed in these materials.

Residuum in the county consists of material that has weathered from bedrock. It occurs in combination with overlying deposits of loess and glacial till or drift. The bedrock is Pennsylvanian

(about 315 million to 225 million years ago) in age (Willman and others, 1975). Wellston soils formed in residuum.

Climate

Climate is a very important factor in soil formation because of its effects on weathering, plant and animal life, and erosion. Temperature and precipitation are important components of the climatic factor. They affect the physical and chemical nature of the soil. The weathering of minerals in soils increases as temperature increases. Precipitation provides the water necessary for most physical and chemical weathering processes. Climate also affects soil formation by interacting with plant and animal life in the soil.

The humid, continental climate in Washington County has generally favored the rapid weathering of soil material, the formation of clay, and the downward movement of clay into the subsoil.

Plant and Animal Life

The major contribution of plant and animal life to soil formation is the addition of organic matter. The amount and kind of organic material in the soil depend on the kind of plants that grew there. Native vegetation in Washington County was dominantly deciduous forest and tall grass prairie. Soils that formed under deciduous forest have a light colored surface soil. The organic matter in these soils is derived primarily from decomposed leaf litter. These soils generally have less organic matter than those that formed under grasses. Marine soils, for example, formed under deciduous forest. Soils that formed under prairie grasses have a darker surface soil. In these areas the grasses had very extensive fibrous root systems that added large amounts of organic matter to the soil when they died and decayed. Herrick soils formed under prairie grasses.

Bacteria, fungi, and other micro-organisms help to break down organic matter in the soil and recycle nutrients for use by plants and other organisms. The stability of soil aggregates is affected by microbial activity. Cellular excretions from these organisms help to bind soil particles together. Stable aggregates help to maintain soil porosity and promote a favorable soil-water-air relationship. Earthworms, crayfish, insects, and large burrowing animals incorporate organic matter into the soil and help to keep soils open and porous.

Relief

Relief, or topography, influences soil formation by the effect it has on natural drainage, infiltration, runoff, erosion, soil temperature, and native plant community distribution.

The more sloping soils generally are naturally well drained or moderately well drained. The well drained Alford and moderately well drained Ava soils are examples. Soils that are in nearly level areas generally are somewhat poorly drained or poorly drained. The somewhat poorly drained Marine and poorly drained Rushville soils are examples. Drainage, through its effect on aeration of the soil, also contributes to the color of the soil. In well aerated soils, the iron and aluminum compounds that give most soils their color are oxidized and brightly colored, dominated by yellowish and brownish colors. In poorly aerated soils where deoxidation of the compounds has occurred, the soils are dominated by gray colors and generally have an abundance of mottling.

As slope gradient increases, the rate of water infiltration decreases and the rate of runoff and the hazard of water erosion increase. Soil formation in Hickory and Blair soils, for example, has been greatly affected by runoff and erosion.

Aspect, or the direction a slope faces, has a microclimatic influence on soils. South- and west-facing slopes are generally warmer and drier than north- and east-facing slopes because they face the sun more directly and for longer periods during the day.

Native plant community distribution was influenced by relief. Before the county was settled, natural wildfires, spread by the wind, often burned across the wide summits. The fires were suppressed, however, in areas of more rolling topography where windspeed was lower and moisture relations were less favorable for fire. The fires played a major role in native plant community distribution and soil formation by eliminating tree and shrub growth in favor of grasses on the summits, where dark prairie soils developed. In the more rolling areas where fires were suppressed, deciduous forest and light colored forest soils dominate.

Time

The length of time that the soil material remains in place and is acted on by the other soil-forming processes has an influence on the degree of soil profile development. Soils in stable landscape

positions, where the processes of soil formation have been occurring for a long time, generally have well defined genetic horizons. Marine soils are examples. Soils in positions that receive deposition, such as those on a flood plain, where the processes of soil formation have had much less time to act, generally have less profile development. Birds soils are examples.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep, rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as:

Very low	0 to 3
Low	3 to 6
Moderate	6 to 9
High	9 to 12
Very high	more than 12

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, and K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on the contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Capillary water. Water held as a film around soil

particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard, compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles 2 millimeters to 38 centimeters (15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium. Soil material or rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or establishing terraces, diversions, and other water-control structures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Congeliturbate. Soil material disturbed by frost action.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies

among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by

water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, for example, fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess sodium (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly, a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of clayey soils that shrink and swell considerably with changes in moisture content.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also, the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial meltwater. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of the material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate

can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by the wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium,* from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse,* more than 15 millimeters (about 0.6 inch).

Muck. Dark, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management, such as slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep-sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 drawbar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the substratum. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Similar soils. Soils that share limits of diagnostic criteria, behave and perform in a similar manner, and have similar conservation needs or management requirements for the major land uses in the survey area.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest

site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the substratum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a

series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). A layer of otherwise suitable soil material that is too thin for the specified use.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, in soils in extremely small amounts. They are essential to plant growth.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer of a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by meltwater streams, in a glacial lake or other body of still water in front of a glacier.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

Table 1.--Temperature and Precipitation

(Recorded in the period 1961-90 at Nashville, Illinois)

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January-----	37.7	20.7	29.2	66	-11	4	1.90	0.69	2.90	4	5.5
February----	42.6	24.7	33.7	70	-3	9	2.47	1.43	3.39	4	4.8
March-------	55.2	35.1	45.1	80	12	72	3.88	2.25	5.32	7	2.4
April-------	66.7	45.0	55.9	86	25	216	3.70	1.97	5.22	6	.6
May---------	76.2	54.4	65.3	91	35	474	4.01	2.26	5.57	6	.0
June--------	85.1	63.3	74.2	97	47	722	3.38	1.81	4.77	6	.0
July--------	88.5	67.1	77.8	99	52	860	3.72	1.74	5.43	5	.0
August------	86.5	64.6	75.5	100	48	790	2.96	1.44	4.27	4	.0
September---	80.1	57.9	69.0	95	37	568	3.14	1.46	4.58	4	.0
October-----	68.9	46.7	57.8	88	27	271	3.04	1.38	4.46	5	.0
November----	55.1	36.6	45.9	78	15	69	3.53	1.65	5.15	6	.0
December----	42.5	25.9	34.2	68	-3	12	3.39	1.52	4.99	5	3.6
Yearly:											
Average---	65.4	45.2	55.3	---	---	---	---	---	---	---	---
Extreme---	---	---	---	101	-12	---	---	---	---	---	---
Total-----	---	---	---	---	---	4,066	39.11	32.48	45.21	62	16.9

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 degrees F).

Table 2.--Freeze Dates in Spring and Fall

(Recorded in the period 1961-90 at Nashville, Illinois)

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Apr. 7	Apr. 13	May 2
2 years in 10 later than--	Mar. 31	Apr. 9	Apr. 20
5 years in 10 later than--	Mar. 24	Mar. 29	Apr. 7
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 2	Oct. 19	Oct. 4
2 years in 10 earlier than--	Nov. 6	Oct. 24	Oct. 9
5 years in 10 earlier than--	Nov. 13	Nov. 3	Oct. 24

Table 3.--Growing Season

(Recorded in the period 1961-90 at Nashville, Illinois)

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	212	191	167
8 years in 10	220	209	176
5 years in 10	236	220	200
2 years in 10	254	233	214
1 year in 10	263	241	220

Table 4.--Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
2	Cisne silt loam	6,600	1.8
3A	Hoyleton silt loam, 0 to 2 percent slopes	17,800	4.9
3B	Hoyleton silt loam, 2 to 5 percent slopes	7,100	2.0
4B	Richview silt loam, 2 to 5 percent slopes	550	0.2
4C2	Richview silt loam, 5 to 10 percent slopes, eroded	410	0.1
5C2	Blair silt loam, 5 to 10 percent slopes, eroded	9,710	2.7
5C3	Blair silt loam, 5 to 10 percent slopes, severely eroded	15,225	4.2
5D	Blair silt loam, 10 to 15 percent slopes	1,185	0.3
5D3	Blair silt loam, 10 to 15 percent slopes, severely eroded	3,380	0.9
7D3	Atlas silty clay loam, 10 to 15 percent slopes, severely eroded	685	0.2
8D2	Hickory silt loam, 10 to 15 percent slopes, eroded	4,770	1.3
8D3	Hickory silty clay loam, 10 to 15 percent slopes, severely eroded	5,895	1.6
8E	Hickory silt loam, 15 to 30 percent slopes	9,060	2.5
8E3	Hickory clay loam, 15 to 30 percent slopes, severely eroded	5,565	1.5
8G	Hickory silt loam, 30 to 60 percent slopes	1,355	0.4
12	Wynoose silt loam	4,170	1.2
13A	Bluford silt loam, 0 to 2 percent slopes	17,400	4.8
13B	Bluford silt loam, 2 to 5 percent slopes	10,700	3.0
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded	6,590	1.8
14B	Ava silt loam, 2 to 5 percent slopes	8,960	2.5
14C2	Ava silt loam, 5 to 10 percent slopes, eroded	740	0.2
14C3	Ava silty clay loam, 5 to 10 percent slopes, severely eroded	10	*
16	Rushville silt loam	2,810	0.8
46A	Herrick silt loam, 0 to 2 percent slopes	1,335	0.4
48	Ebbert silt loam	510	0.1
50	Virden silt loam	985	0.3
84	Okaw silt loam	300	0.1
112	Cowden silt loam	3,940	1.1
113A	Oconee silt loam, 0 to 2 percent slopes	6,450	1.8
113B	Oconee silt loam, 2 to 5 percent slopes	3,480	1.0
120	Huey silt loam	3,745	1.0
127B	Harrison silt loam, 2 to 5 percent slopes	1,610	0.4
164A	Stoy silt loam, 0 to 2 percent slopes	35	*
164B	Stoy silt loam, 2 to 5 percent slopes	60	*
164C2	Stoy silt loam, 5 to 10 percent slopes, eroded	10	*
165	Weir silt loam	20	*
214B	Hosmer silt loam, 2 to 5 percent slopes	110	*
214C2	Hosmer silt loam, 5 to 10 percent slopes, eroded	10	*
214C3	Hosmer silt loam, 5 to 10 percent slopes, severely eroded	30	*
214D	Hosmer silt loam, 10 to 18 percent slopes	5	*
214D3	Hosmer silt loam, 10 to 18 percent slopes, severely eroded	15	*
308B2	Alford silt loam, 2 to 5 percent slopes, eroded	1,335	0.4
308C2	Alford silt loam, 5 to 10 percent slopes, eroded	240	0.1
338A	Hurst silt loam, 0 to 2 percent slopes	1,480	0.4
432B	Geff silt loam, 2 to 5 percent slopes	445	0.1
453B	Muren silt loam, 2 to 5 percent slopes	20,640	5.7
453C2	Muren silt loam, 5 to 10 percent slopes, eroded	3,950	1.1
474	Piasa silt loam	2,620	0.7
517A	Marine silt loam, 0 to 2 percent slopes	16,210	4.5
533	Urban land	210	0.1
584C2	Grantfork silt loam, 5 to 10 percent slopes, eroded	1,425	0.4
584C3	Grantfork silty clay loam, 5 to 10 percent slopes, severely eroded	2,550	0.7
584D2	Grantfork silt loam, 10 to 15 percent slopes, eroded	460	0.1
621B2	Coulterville silt loam, 2 to 5 percent slopes, eroded	75	*
621C3	Coulterville silty clay loam, 5 to 10 percent slopes, severely eroded	40	*
801B	Orthents, silty, undulating	740	0.2
821C	Morristown silt loam, 3 to 12 percent slopes	380	0.1
821G	Morristown channery silt loam, 12 to 60 percent slopes	280	0.1
850D3	Hickory-Hosmer complex, 10 to 18 percent slopes, severely eroded	10	*
880A	Darmstadt-Coulterville complex, 0 to 2 percent slopes	15,945	4.4
880B2	Darmstadt-Coulterville complex, 2 to 5 percent slopes, eroded	17,485	4.8
900E	Hickory-Wellston complex, 18 to 30 percent slopes	1,680	0.5
900G	Wellston-Hickory complex, 30 to 60 percent slopes	1,425	0.4
909A	Coulterville-Oconee complex, 0 to 2 percent slopes	5	*
909B	Coulterville-Oconee complex, 2 to 5 percent slopes	35	*
912A	Darmstadt-Hoyleton complex, 0 to 2 percent slopes	14,165	3.9
912B2	Darmstadt-Hoyleton complex, 2 to 5 percent slopes, eroded	4,030	1.1
916A	Darmstadt-Oconee complex, 0 to 2 percent slopes	24,165	6.7
916B2	Darmstadt-Oconee complex, 2 to 5 percent slopes, eroded	5,740	1.6
920	Huey-Rushville complex	1,415	0.4

See footnote at end of table.

Table 4.--Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
929D3	Hickory-Ava complex, 10 to 18 percent slopes, severely eroded	60	*
934D3	Blair-Grantfork complex, 7 to 15 percent slopes, severely eroded	5	*
941	Piasa-Virden complex	1,050	0.3
991	Huey-Cisne complex	2,915	0.8
993	Piasa-Cowden complex	4,850	1.3
995	Piasa-Herrick complex	2,435	0.7
1288	Petrolia silty clay loam, wet	645	0.2
1334	Birds silt loam, wet	7,090	2.0
3084	Okaw silty clay loam, frequently flooded	275	0.1
3108	Bonnie silt loam, frequently flooded	70	*
3288	Petrolia silty clay loam, frequently flooded	325	0.1
3333	Wakeland silt loam, frequently flooded	3,300	0.9
3334	Birds silt loam, frequently flooded	12,400	3.4
3336	Wilbur silt loam, frequently flooded	14,005	3.9
3382	Belknap silt loam, frequently flooded	130	*
3415	Orion silt loam, frequently flooded	3,305	0.9
3787	Banlic silt loam, frequently flooded	5	*
7084	Okaw silt loam, rarely flooded	605	0.2
7122B	Colp silty clay loam, 2 to 5 percent slopes, eroded, rarely flooded	780	0.2
7337A	Creal silt loam, 0 to 2 percent slopes, rarely flooded	210	0.1
7338A	Hurst silt loam, 0 to 2 percent slopes, rarely flooded	1,840	0.5
8109	Racoon silt loam, occasionally flooded	265	0.1
	Water	1,835	0.5
	Total	360,900	100.0

* Less than 0.1 percent.

Table 5.--Prime Farmland

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
2	Cisne silt loam (where drained)
3A	Hoyleton silt loam, 0 to 2 percent slopes
3B	Hoyleton silt loam, 2 to 5 percent slopes
4B	Richview silt loam, 2 to 5 percent slopes
13A	Bluford silt loam, 0 to 2 percent slopes (where drained)
13B	Bluford silt loam, 2 to 5 percent slopes
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded
14B	Ava silt loam, 2 to 5 percent slopes
46A	Herrick silt loam, 0 to 2 percent slopes
48	Ebbert silt loam (where drained)
50	Virden silt loam (where drained)
112	Cowden silt loam (where drained)
113A	Oconee silt loam, 0 to 2 percent slopes (where drained)
113B	Oconee silt loam, 2 to 5 percent slopes
127B	Harrison silt loam, 2 to 5 percent slopes
164A	Stoy silt loam, 0 to 2 percent slopes
164B	Stoy silt loam, 2 to 5 percent slopes
214B	Hosmer silt loam, 2 to 5 percent slopes
308B2	Alford silt loam, 2 to 5 percent slopes, eroded
432B	Geff silt loam, 2 to 5 percent slopes
453B	Muren silt loam, 2 to 5 percent slopes
517A	Marine silt loam, 0 to 2 percent slopes (where drained)
621B2	Coulterville silt loam, 2 to 5 percent slopes, eroded (where drained)
909A	Coulterville-Oconee complex, 0 to 2 percent slopes (where drained)
909B	Coulterville-Oconee complex, 2 to 5 percent slopes (where drained)
3108	Bonnie silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3288	Petrolia silty clay loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3333	Wakeland silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3334	Birds silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3336	Wilbur silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3382	Belknap silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
3415	Orion silt loam, frequently flooded (where protected from flooding or not frequently flooded during the growing season)
3787	Banlic silt loam, frequently flooded (where drained and either protected from flooding or not frequently flooded during the growing season)
7122B	Colp silty clay loam, 2 to 5 percent slopes, eroded, rarely flooded
7337A	Creal silt loam, 0 to 2 percent slopes, rarely flooded (where drained)
8109	Racoon silt loam, occasionally flooded (where drained)

Table 6.--Land Capability and Yields per Acre of Crops and Pasture

(Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume	Grass-clover	Grain sorghum
		Bu	Bu	Bu	Tons	AUM*	Bu
2--------------- Cisne	IIIw	115	35	52	---	---	99
3A-------------- Hoyleton	IIw	116	34	53	4.7	---	100
3B-------------- Hoyleton	IIe	115	34	52	4.7	---	99
4B-------------- Richview	IIe	109	33	50	4.6	---	94
4C2------------- Richview	IIIe	103	29	47	4.3	7.1	89
5C2------------- Blair	IIIe	89	31	41	3.5	5.8	77
5C3------------- Blair	IVe	82	29	38	3.2	5.4	71
5D-------------- Blair	IVe	86	30	40	3.3	5.8	74
5D3------------- Blair	VIe	---	---	---	3.1	5.1	---
7D3------------- Atlas	VIe	---	---	---	1.7	2.8	---
8D2------------- Hickory	IIIe	72	23	26	2.7	4.5	62
8D3------------- Hickory	IVe	66	21	24	2.5	4.1	57
8E-------------- Hickory	VIe	---	---	---	2.4	4.0	---
8E3------------- Hickory	VIe	---	---	---	1.9	3.2	---
8G-------------- Hickory	VIIe	---	---	---	---	---	---
12-------------- Wynoose	IIIw	96	33	46	---	---	83
13A------------- Bluford	IIw	103	33	49	4.1	---	89
13B------------- Bluford	IIe	102	33	49	4.1	---	88
13B2------------ Bluford	IIe	99	32	47	3.9	---	85
14B------------- Ava	IIe	97	33	48	4.3	7.1	83
14C2------------ Ava	IIIe	89	30	44	3.9	6.6	77
14C3------------ Ava	IVe	74	25	36	3.3	5.5	64

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume	Grass-clover	Grain sorghum
		Bu	Bu	Bu	Tons	AUM*	Bu
16-------------- Rushville	IIIw	99	34	48	---	---	85
46A------------- Herrick	IIw	141	45	61	5.5	---	121
48-------------- Ebbert	IIIw	130	42	54	---	---	112
50-------------- Virden	IIw	144	46	60	---	---	124
84-------------- Okaw	IIIw	84	28	41	---	---	72
112------------- Cowden	IIw	120	37	53	---	---	103
113A------------ Oconee	IIw	120	40	54	5.0	---	103
113B------------ Oconee	IIe	119	39	53	4.9	---	102
120------------- Huey	IVw	82	28	40	---	---	71
127B------------ Harrison	IIe	144	44	60	5.5	---	124
164A------------ Stoy	IIw	112	35	52	4.5	---	96
164B------------ Stoy	IIe	111	35	51	4.5	---	95
164C2----------- Stoy	IIIe	105	33	49	4.2	7.1	90
165------------- Weir	IIIw	103	34	45	---	---	89
214B------------ Hosmer	IIe	107	35	50	4.6	7.4	92
214C2----------- Hosmer	IIIe	98	32	46	4.2	6.8	84
214C3----------- Hosmer	IVe	82	30	38	3.8	5.9	71
214D------------ Hosmer	IVe	98	32	44	4.0	6.4	84
214D3----------- Hosmer	VIe	---	---	---	3.3	5.5	---
308B2----------- Alford	IIe	109	37	50	5.0	8.5	94
308C2----------- Alford	IIIe	105	36	48	4.8	8.0	90
338A------------ Hurst	IIIw	87	32	45	3.6	---	75
432B------------ Geff	IIe	112	34	48	5.0	---	96

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume	Grass-clover	Grain sorghum
		Bu	Bu	Bu	Tons	AUM*	Bu
453B------------ Muren	IIe	115	39	53	5.1	8.6	99
453C2----------- Muren	IIIe	108	38	50	4.9	8.1	93
474------------- Piasa	IIIw	98	35	47	---	---	84
517A------------ Marine	IIw	102	34	50	4.8	---	88
533. Urban land							
584C2----------- Grantfork	IVe	55	20	25	2.5	4.1	47
584C3----------- Grantfork	VIe	---	---	---	2.3	3.8	---
584D2----------- Grantfork	VIe	---	---	---	2.4	3.9	---
621B2----------- Coulterville	IIe	89	29	42	3.7	6.1	77
621C3----------- Coulterville	IVe	72	24	34	3.0	4.9	62
801B------------ Orthents	IIe	81	21	28	---	---	---
821C------------ Morristown	IIIs	---	---	---	3.0	3.5	---
821G------------ Morristown	VIIe	---	---	---	---	---	---
850D3----------- Hickory-Hosmer	VIe	---	---	---	2.3	3.5	---
880A------------ Darmstadt-Coulterville	IIIw	92	30	44	3.8	---	79
880B2----------- Darmstadt-Coulterville	IIIe	86	28	41	3.6	5.9	74
900E------------ Hickory-Wellston	VIe	---	---	---	2.3	3.5	---
900G------------ Wellston-Hickory	VIIe	---	---	---	---	---	---
909A------------ Coulterville-Oconee	IIw	107	35	49	4.4	---	92
909B------------ Coulterville-Oconee	IIe	106	35	49	4.4	7.3	91
912A------------ Darmstadt-Hoyleton	IIIw	101	33	47	4.2	---	87

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume	Grass-clover	Grain sorghum
		Bu	Bu	Bu	Tons	AUM*	Bu
912B2------------ Darmstadt-Hoyleton	IIIe	96	32	45	4.0	6.6	83
916A------------- Darmstadt-Oconee	IIIw	100	31	47	4.1	---	89
916B2------------ Darmstadt-Oconee	IIIe	96	32	45	4.0	6.6	83
920-------------- Huey-Rushville	IVw	90	31	44	---	---	77
929D3------------ Hickory-Ava	IVe	68	22	28	2.6	4.5	58
934D3------------ Blair-Grantfork	VIe	---	---	---	2.6	4.1	---
941-------------- Piasa-Virden	IIIw	120	40	53	---	---	103
991-------------- Huey-Cisne	IVw	98	31	46	---	---	84
993-------------- Piasa-Cowden	IIIw	108	36	50	---	---	93
995-------------- Piasa-Herrick	IIIw	118	40	54	4.6	---	101
1288------------- Petrolia	Vw	---	---	---	---	---	---
1334------------- Birds	Vw	---	---	---	---	---	---
3084------------- Okaw	IVw	---	---	---	---	---	---
3108------------- Bonnie	IIIw	113	37	---	---	6.7	97
3288------------- Petrolia	IIIw	118	37	---	---	---	101
3333------------- Wakeland	IIw	128	41	50	---	7.8	110
3334------------- Birds	IIIw	122	39	47	---	7.3	105
3336------------- Wilbur	IIw	125	40	---	---	7.8	108
3382------------- Belknap	IIw	124	39	---	---	7.7	107
3415------------- Orion	IIIw	132	43	---	---	7.8	114
3787------------- Banlic	IIw	115	37	---	---	7.0	99
7084------------- Okaw	IIIw	84	28	41	---	---	72

See footnote at end of table.

Table 6.--Land Capability and Yields per Acre of Crops and Pasture--Continued

Soil name and map symbol	Land capability	Corn	Soybeans	Winter wheat	Grass-legume	Grass-clover	Grain sorghum
		Bu	Bu	Bu	Tons	AUM*	Bu
7122B----------- Colp	IIIe	81	30	40	3.4	5.6	70
7337A----------- Creal	IIw	109	35	51	4.3	---	94
7338A----------- Hurst	IIIw	87	32	45	3.6	---	75
8109------------ Racoon	IIw	103	33	---	---	---	89

* Animal unit month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

Table 7.--Woodland Management and Productivity

(Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available)

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
5C2, 5C3, 5D, 5D3: Blair	4A	Slight	Slight	Slight	Slight	White oak	70	4	Northern red oak, bitternut hickory, eastern white pine, black cherry.
						Northern red oak	70	4	
						White ash	---	---	
						Shagbark hickory	---	---	
7D3: Atlas	4C	Slight	Slight	Moderate	Moderate	White oak	70	4	White ash, northern red oak, red maple, bitternut hickory, eastern white pine.
						Northern red oak	70	4	
						Shagbark hickory	---	---	
						White ash	---	---	
8D2, 8D3: Hickory	5A	Slight	Slight	Slight	Slight	White oak	85	5	White oak, yellow-poplar, eastern white pine, pignut hickory, blackberry, black walnut.
						Northern red oak	85	5	
						Black oak	---	---	
						White ash	---	---	
						Bitternut hickory	---	---	
8E, 8E3: Hickory	5R	Moderate	Moderate	Slight	Slight	White oak	85	5	White oak, yellow-poplar, eastern white pine, pignut hickory, blackberry, black walnut.
						Northern red oak	85	5	
						Black oak	---	---	
						White ash	---	---	
						Bitternut hickory	---	---	
						Yellow-poplar	95	7	
8G: Hickory	5R	Severe	Severe	Slight	Slight	White oak	85	5	White oak, yellow-poplar, eastern white pine, red pine, sugar maple, black walnut.
						Northern red oak	85	5	
						Black oak	---	---	
						Green ash	---	---	
						Bitternut hickory	---	---	
						Yellow-poplar	95	7	
12: Wynoose	4W	Slight	Severe	Moderate	Moderate	Post oak	70	4	Sugar maple, red maple, eastern redcedar.
						White oak	---	---	
						Black oak	---	---	
13B, 13B2: Bluford	4A	Slight	Slight	Slight	Slight	White oak	70	4	Northern red oak, bitternut hickory, eastern white pine, eastern redcedar.
						Northern red oak	70	4	
						White ash	---	---	
						Shagbark hickory	---	---	
14B, 14C2, 14C3: Ava	4A	Slight	Slight	Slight	Slight	White oak	75	4	Black walnut, eastern cottonwood, sweetgum, yellow-poplar, white oak, American sycamore.
						Northern red oak	80	4	
						Bitternut hickory	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
16-------------- Rushville	4W	Slight	Severe	Moderate	Moderate	Post oak------------	70	4	Sugar maple, red maple, eastern redcedar.
						Shingle oak---------	---	---	
						Blackjack oak-------	---	---	
84-------------- Okaw	4W	Slight	Severe	Severe	Severe	Pin oak-------------	70	4	Pin oak, baldcypress, green ash, water tupelo, swamp white oak.
						Blackjack oak-------	60	3	
						Black oak-----------	55	3	
						White oak-----------	---	---	
164C2----------- Stoy	4A	Slight	Slight	Slight	Slight	White oak-----------	70	4	Northern red oak, bitternut hickory, eastern white pine, black cherry, eastern redcedar.
						White ash-----------	---	---	
						Shagbark hickory----	---	---	
165------------- Weir	4W	Slight	Moderate	Moderate	Slight	Pin oak-------------	70	4	Baldcypress, pin oak, water tupelo, red maple.
						White oak-----------	---	---	
						Black oak-----------	---	---	
						Pignut hickory------	---	---	
214B, 214C2, 214C3, 214D, 214D3---------- Hosmer	4A	Slight	Slight	Slight	Slight	White oak-----------	75	4	Eastern white pine, yellow-poplar, white ash, white oak, bitternut hickory.
						Sugar maple---------	75	3	
						Pignut hickory------	---	---	
308B2, 308C2---- Alford	5A	Slight	Slight	Slight	Slight	White oak-----------	90	5	Eastern white pine, white oak, pignut hickory, yellow-poplar, white ash, black locust.
338A------------ Hurst	4C	Slight	Slight	Moderate	Moderate	White oak-----------	70	4	Green ash, pin oak, silver maple, hackberry.
						Green ash-----------	---	---	
						Bur oak-------------	---	---	
						Hackberry-----------	---	---	
453B, 453C2----- Muren	5A	Slight	Slight	Slight	Slight	White oak-----------	90	5	Eastern white pine, northern red oak, bitternut hickory, black locust, yellow-poplar, white ash.
						White ash-----------	---	---	
						Shagbark hickory----	---	---	
584C2, 584C3, 584D2---------- Grantfork	4T	Slight	Slight	Slight	Slight	Black oak-----------	70	4	Eastern redcedar, shingle oak, eastern white pine, bitternut hickory, white ash.
						Shingle oak---------	---	---	
						Shagbark hickory----	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
621B2, 621C3: Coulterville	4A	Slight	Slight	Slight	Slight	White oak	70	4	Eastern white pine, white oak, white ash, eastern redcedar, shagbark hickory.
						Black oak	---	---	
						Pignut hickory	---	---	
801B: Orthents	---	--------	--------	--------	--------	--------------------	---	---	Black walnut, white oak, northern red oak, yellow-poplar, green ash, black locust.
850D3: Hickory	5A	Slight	Slight	Slight	Slight	White oak	85	5	White oak, yellow-poplar, eastern white pine, red pine, sugar maple, black walnut.
						Northern red oak	85	5	
						Black oak	---	---	
						Green ash	---	---	
						Bitternut hickory	---	---	
						Yellow-poplar	95	7	
Hosmer	4A	Slight	Slight	Slight	Slight	White oak	75	4	Eastern white pine, shortleaf pine, red pine, yellow-poplar, white ash.
						Yellow-poplar	90	6	
						Virginia pine	75	8	
						Sugar maple	75	3	
880A, 880B2: Darmstadt	4T	Slight	Slight	Moderate	Slight	White oak	70	4	Eastern white pine, white oak, white ash, eastern redcedar, shagbark hickory.
						Black oak	70	4	
						Pignut hickory	---	---	
Coulterville	4A	Slight	Slight	Slight	Slight	White oak	70	4	Eastern white pine, white oak, white ash, eastern redcedar, shagbark hickory.
						Black oak	---	---	
						Pignut hickory	---	---	
900E: Hickory	5R	Moderate	Moderate	Slight	Slight	White oak	85	5	White oak, yellow-poplar, eastern white pine, pignut hickory, black cherry, black walnut.
						Northern red oak	85	5	
						Black oak	---	---	
						White ash	---	---	
						Bitternut hickory	---	---	
Wellston	4R	Moderate	Moderate	Slight	Slight	Northern red oak	81	4	Eastern white pine, black walnut, yellow-poplar, white ash, white oak, northern red oak.
						White oak	---	---	
						Black walnut	---	---	
						Black cherry	---	---	
						Sugar maple	---	---	
						White ash	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordi-nation symbol	Management concerns: Erosion hazard	Management concerns: Equip-ment limita-tion	Management concerns: Seedling mortal-ity	Management concerns: Wind-throw hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Produc-tivity class*	Trees to plant
900G:									
Wellston	4R	Severe	Severe	Slight	Slight	Northern red oak	81	4	Eastern white pine, black walnut, yellow-poplar, white ash, white oak, northern red oak.
						White oak	---	---	
						Black walnut	---	---	
						Black cherry	---	---	
						Sugar maple	---	---	
						White ash	---	---	
Hickory	5R	Severe	Severe	Slight	Slight	White oak	85	5	White oak, yellow-poplar, eastern white pine, pignut hickory, black cherry, black walnut.
						Northern red oak	85	5	
						Black oak	---	---	
						White ash	---	---	
						Bitternut hickory	---	---	
						Yellow-poplar	95	7	
909A, 909B:									
Coulterville	4A	Slight	Slight	Slight	Slight	White oak	70	4	Eastern white pine, white oak, white ash, eastern redcedar.
						Black oak	---	---	
						Pignut hickory	---	---	
Oconee.									
912A, 912B2:									
Darmstadt	4T	Slight	Slight	Moderate	Slight	White oak	70	4	Eastern white pine, white oak, white ash, eastern redcedar, shagbark hickory.
						Black oak	70	4	
						Pignut hickory	---	---	
Hoyleton	4A	Slight	Slight	Slight	Slight	White oak	70	4	White oak, eastern white pine, northern red oak, white ash.
						Northern red oak	70	4	
						Green ash	---	---	
						Bur oak	---	---	
916A, 916B2:									
Darmstadt	4T	Slight	Slight	Moderate	Slight	White oak	70	4	Eastern white pine, white oak, white ash, eastern redcedar, shagbark hickory.
						Black oak	70	4	
						Pignut hickory	---	---	
Oconee.									
920:									
Huey	3T	Slight	Severe	Severe	Moderate	White ash	60	3	Eastern redcedar, eastern white pine, white ash.
						White oak	---	---	
						Shingle oak	---	---	
						Sugar maple	---	---	
						Post oak	---	---	
Rushville	4W	Slight	Severe	Severe	Moderate	Post oak	70	4	Sugar maple, red maple, eastern redcedar.
						Shingle oak	---	---	
						Blackjack oak	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
929D3:									
Hickory	5A	Slight	Slight	Slight	Slight	White oak	85	5	White oak, yellow-poplar, eastern white pine, red pine, sugar maple, black walnut.
						Northern red oak	85	5	
						Black oak	---	---	
						Green ash	---	---	
						Bitternut hickory	---	---	
						Yellow-poplar	95	7	
Ava	4A	Slight	Slight	Slight	Slight	White oak	75	4	Black walnut, eastern cottonwood, sweetgum, yellow-poplar, white oak, American sycamore.
						Northern red oak	80	4	
						Yellow-poplar	90	6	
						Black walnut	---	---	
934D3:									
Blair	4A	Slight	Slight	Slight	Slight	White oak	70	4	Shortleaf pine, loblolly pine, eastern white pine.
						Northern red oak	70	4	
						Green ash	---	---	
						Bur oak	70	4	
Grantfork	4T	Slight	Slight	Slight	Slight	Black oak	70	4	Eastern redcedar, eastern white pine, green ash, white ash.
						Post oak	---	---	
						Shagbark hickory	---	---	
1288 Petrolia	5W	Slight	Moderate	Moderate	Slight	Pin oak	90	5	Eastern cottonwood, American sycamore, baldcypress, swamp white oak.
						Eastern cottonwood	100	9	
						Sweetgum	---	---	
						American sycamore	---	---	
						River birch	---	---	
						Black willow	---	---	
1334 Birds	5W	Slight	Severe	Moderate	Moderate	Pin oak	90	5	Eastern cottonwood, pin oak, American sycamore, baldcypress, swamp white oak.
						Eastern cottonwood	100	9	
						Sweetgum	---	---	
						American sycamore	---	---	
						River birch	---	---	
						Silver maple	---	---	
3084 Okaw	4W	Slight	Severe	Severe	Severe	Pin oak	70	4	Pin oak, baldcypress, green ash, water tupelo, red maple, swamp white oak.
						Blackjack oak	60	3	
						Black oak	55	3	
						White oak	---	---	
3108 Bonnie	5W	Slight	Severe	Severe	Severe	Pin oak	90	5	Eastern cottonwood, American sycamore, baldcypress, pin oak, swamp white oak.
						Silver maple	---	---	
						American sycamore	---	---	

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Windthrow hazard	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
3288------------ Petrolia	5W	Slight	Severe	Moderate	Severe	Pin oak------------- Eastern cottonwood-- Sweetgum------------ American sycamore---	90 100 --- ---	5 9 --- ---	Eastern cottonwood, American sycamore, baldcypress, swamp white oak, pin oak.
3333------------ Wakeland	5A	Slight	Slight	Slight	Slight	Pin oak------------- Sweetgum------------ Green ash----------- Hackberry-----------	90 88 --- ---	5 7 --- ---	Bur oak, American sycamore, red maple, green ash.
3334------------ Birds	5W	Slight	Severe	Moderate	Moderate	Pin oak------------- Eastern cottonwood-- Sweetgum------------ American sycamore--- River birch--------- Silver maple--------	90 100 --- --- --- ---	5 9 --- --- --- ---	Eastern cottonwood, red maple, American sycamore, pin oak, baldcypress, swamp white oak.
3336------------ Wilbur	5A	Slight	Slight	Slight	Slight	Pin oak------------- Green ash----------- Sweetgum------------ Hackberry-----------	90 --- --- ---	5 --- --- ---	Green ash, hackberry, black walnut, bur oak.
3382------------ Belknap	6A	Slight	Slight	Slight	Slight	Yellow-poplar------- Eastern cottonwood-- American sycamore--- Sweetgum------------ Pin oak-------------	90 100 --- --- 90	6 9 --- --- 5	Eastern cottonwood, red maple, American sycamore, sweetgum, baldcypress.
3415------------ Orion	2W	Slight	Moderate	Slight	Slight	Silver maple-------- Green ash----------- Hackberry-----------	80 --- ---	2 --- ---	Bur oak, silver maple, green ash, eastern cottonwood.
3787------------ Banlic	4A	Slight	Slight	Slight	Slight	White oak----------- Pin oak------------- Southern red oak---- Yellow-poplar------- Black walnut--------	75 90 85 --- ---	4 5 5 --- ---	Black walnut, sweetgum, white oak, yellow-poplar, American sycamore, green ash.
7084------------ Okaw	4W	Slight	Severe	Severe	Severe	Pin oak------------- Silver maple-------- American sycamore---	70 --- ---	4 --- ---	Pin oak, baldcypress, eastern cottonwood, American sycamore, swamp white oak.
7122B----------- Colp	4A	Slight	Slight	Slight	Slight	White oak----------- Green ash----------- Bur oak------------- Hackberry-----------	70 --- 70 ---	4 --- 4 ---	Black walnut, green ash, eastern white pine, hackberry, persimmon.

See footnote at end of table.

Table 7.--Woodland Management and Productivity--Continued

Soil name and map symbol	Ordination symbol	Management concerns: Erosion hazard	Equipment limitation	Seedling mortality	Windthrow hazard	Potential productivity: Common trees	Site index	Productivity class*	Trees to plant
7338A----------- Hurst	4C	Slight	Slight	Moderate	Moderate	White oak----------- Green ash----------- Bur oak------------- Silver maple--------	70 --- --- ---	4 --- --- ---	Green ash, pin oak, hackberry, pecan, baldcypress.
8109------------ Racoon	4W	Slight	Severe	Moderate	Severe	Pin oak------------- Green ash----------- Silver maple-------- American sycamore---	80 --- --- ---	4 --- --- ---	Baldcypress, pin oak, green ash, swamp white oak.

* Productivity class is the yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

Table 8.--Windbreaks and Environmental Plantings

(The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil)

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
2 Cisne	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, blue spruce, Washington hawthorn.	Eastern white pine	Pin oak.
3A, 3B Hoyleton	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
4B, 4C2 Richview	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
5C2, 5C3, 5D, 5D3 Blair	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, blue spruce, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
7D3 Atlas	American cranberrybush, silky dogwood, Amur honeysuckle, arrowwood, Amur privet, Washington hawthorn, eastern redcedar.	Green ash, Austrian pine.	Pin oak, eastern white pine.	---
8D2, 8D3, 8E, 8E3, 8G Hickory	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
12 Wynoose	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, blue spruce, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
13A, 13B, 13B2 Bluford	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash, Osage-orange.	Eastern white pine, pin oak.	---
14B, 14C2, 14C3 Ava	Washington hawthorn, Amur privet, eastern redcedar, silky dogwood, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
16 Rushville	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, blue spruce, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
46A---------------Herrick	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Austrian pine, blue spruce, Washington hawthorn.	Norway spruce---------	Eastern white pine, pin oak.
48----------------Ebbert	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Norway spruce, Austrian pine, blue spruce, Washington hawthorn.	Eastern white pine----	Pin oak.
50----------------Virden	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, blue spruce, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.
84----------------Okaw	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, blue spruce, Washington hawthorn.	Eastern white pine----	Pin oak.
112---------------Cowden	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, blue spruce, Norway spruce, Washington hawthorn.	Eastern white pine----	Pin oak.
113A, 113B--------Oconee	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
120---------------Huey	Eastern redcedar, Russian-olive, silky dogwood.	Siberian elm, green ash.	---	---
127B--------------Harrison	American cranberrybush, Amur honeysuckle, Russian-olive, silky dogwood.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
164A, 164B, 164C2-Stoy	Washington hawthorn, Amur privet, eastern redcedar, silky dogwood, Amur honeysuckle, arrowwood, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
165---------------Weir	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, white fir, blue spruce, Austrian pine, Norway spruce.	Eastern white pine----	Pin oak.
214B, 214C2, 214C3, 214D, 214D3------------Hosmer	Eastern redcedar, arrowwood, Washington hawthorn, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
308B2, 308C2------Alford	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
338A-------------- Hurst	Washington hawthorn, Amur privet, arrowwood, silky dogwood, Amur honeysuckle, eastern redcedar, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
432B-------------- Geff	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce---------	Eastern white pine, pin oak.
453B, 453C2------- Muren	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
474--------------- Piasa	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
517A-------------- Marine	Eastern redcedar, American cranberrybush, Amur privet, Washington hawthorn, Amur honeysuckle, autumn-olive, silky dogwood.	Austrian pine, green ash, eastern white pine, Osage-orange.	Pin oak---------------	---
533. Urban land				
584C2, 584C3, 584D2------------ Grantfork	Eastern redcedar, Russian-olive.	Green ash, Siberian elm.	---	---
621B2, 621C3------ Coulterville	Blackhaw, nannyberry viburnum, Washington hawthorn.	Eastern redcedar, white spruce, hackberry, green ash.	Black willow----------	---
801B-------------- Orthents	American cranberrybush, Amur privet, silky dogwood, Amur honeysuckle.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
821C-------------- Morristown	Washington hawthorn, eastern redcedar, jack pine, Russian-olive, Osage-orange.	Honeylocust, northern catalpa.	---	---
821G-------------- Morristown	Siberian peashrub, Amur maple, eastern redcedar, silky dogwood, lilac, gray dogwood.	---	Jack pine, Norway spruce, red pine.	Eastern white pine.
850D3:				
Hickory----------	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Hosmer-----------	Eastern redcedar, arrowwood, Washington hawthorn, Amur honeysuckle, Amur privet, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
880A, 880B2:				
Darmstadt	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
Coulterville	Blackhaw, nannyberry viburnum, Washington hawthorn.	Eastern redcedar, white spruce, hackberry, green ash.	Black willow	---
900E:				
Hickory	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Wellston	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
900G:				
Wellston	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Hickory	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
909A, 909B:				
Coulterville	Blackhaw, nannyberry viburnum, Washington hawthorn.	Eastern redcedar, white spruce, hackberry, green ash.	Black willow	---
Oconee	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
912A, 912B2:				
Darmstadt	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
Hoyleton	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
916A, 916B2:				
Darmstadt	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
Oconee	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
920:				
Huey	Eastern redcedar, Russian-olive, silky dogwood.	Siberian elm, green ash.	---	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
920:				
Rushville	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, blue spruce, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
929D3:				
Hickory	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Blue spruce, Washington hawthorn.	Norway spruce, Austrian pine.	Eastern white pine, pin oak.
Ava	Washington hawthorn, Amur privet, eastern redcedar, silky dogwood, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
934D3:				
Blair	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, blue spruce, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
Grantfork	Eastern redcedar, Russian-olive.	Green ash, Siberian elm.	---	---
941:				
Piasa	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
Virden	Silky dogwood, American cranberrybush, Amur honeysuckle, Amur privet.	Washington hawthorn, blue spruce, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
991:				
Huey	Eastern redcedar, Russian-olive, silky dogwood.	Siberian elm, green ash.	---	---
Cisne	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, blue spruce, white fir, Washington hawthorn.	Eastern white pine	Pin oak.
993:				
Piasa	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
Cowden	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, blue spruce, Norway spruce, Washington hawthorn.	Eastern white pine	Pin oak.
995:				
Piasa	Eastern redcedar, Russian-olive.	Siberian elm, green ash.	---	---
Herrick	Amur honeysuckle, silky dogwood, Amur privet, American cranberrybush.	Austrian pine, white fir, blue spruce, northern whitecedar, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
1288: Petrolia	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Blue spruce, Washington hawthorn, Norway spruce, Austrian pine.	Eastern white pine	Pin oak.
1334: Birds	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Washington hawthorn, blue spruce, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
3084: Okaw	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, blue spruce, Washington hawthorn.	Eastern white pine	Pin oak.
3108: Bonnie	Silky dogwood, Amur honeysuckle, Amur privet, American cranberrybush.	Blue spruce, Washington hawthorn, Norway spruce, Austrian pine.	Eastern white pine	Pin oak.
3288: Petrolia	Silky dogwood, Amur privet, American cranberrybush, Amur honeysuckle.	Blue spruce, Washington hawthorn, Norway spruce, Austrian pine.	Eastern white pine	Pin oak.
3333: Wakeland	Amur honeysuckle, Amur privet, American cranberrybush, silky dogwood.	Northern whitecedar, Austrian pine, white fir, blue spruce, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
3334: Birds	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Washington hawthorn, blue spruce, Austrian pine, Norway spruce.	Eastern white pine	Pin oak.
3336: Wilbur	Amur honeysuckle, American cranberrybush, Amur privet, silky dogwood.	Austrian pine, blue spruce, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
3382: Belknap	Silky dogwood, Amur privet, Amur honeysuckle, American cranberrybush.	Austrian pine, blue spruce, Washington hawthorn.	Norway spruce	Pin oak, eastern white pine.
3415: Orion	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, blue spruce, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
3787: Banlic	Amur privet, arrowwood, eastern redcedar, Washington hawthorn, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
7084: Okaw	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Norway spruce, Austrian pine, blue spruce, Washington hawthorn.	Eastern white pine	Pin oak.
7122B: Colp	Eastern redcedar, Washington hawthorn, Amur privet, arrowwood, Amur honeysuckle, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---

Table 8.--Windbreaks and Environmental Plantings--Continued

Soil name and map symbol	Trees having predicted 20-year average height, in feet, of-- 8-15	16-25	26-35	>35
7337A. Creal	Amur privet, Amur honeysuckle, American cranberrybush, silky dogwood.	Austrian pine, white fir, blue spruce, Washington hawthorn.	Norway spruce	Eastern white pine, pin oak.
7338A. Hurst	Washington hawthorn, Amur privet, arrowwood, silky dogwood, Amur honeysuckle, eastern redcedar, American cranberrybush.	Austrian pine, green ash.	Eastern white pine, pin oak.	---
8109. Racoon	American plum, common chokecherry.	Eastern redcedar, hackberry.	Norway spruce, black willow, northern red oak, green ash, black locust, silver maple.	Eastern cottonwood.

Table 9.--Recreational Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2 Cisne	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
3A, 3B Hoyleton	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
4B Richview	Slight	Slight	Moderate: slope.	Slight	Slight.
4C2 Richview	Slight	Slight	Severe: slope.	Slight	Slight.
5C2, 5C3 Blair	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness.
5D, 5D3 Blair	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
7D3 Atlas	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: slope, wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness, droughty, slope.
8D2, 8D3 Hickory	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
8E, 8E3 Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
8G Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
12 Wynoose	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.
13A, 13B, 13B2 Bluford	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
14B Ava	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: wetness.
14C2, 14C3 Ava	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: wetness.
16 Rushville	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
46A Herrick	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
48 Ebbert	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
50 Virden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
84 Okaw	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
112 Cowden	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
113A, 113B Oconee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
120 Huey	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
127B Harrison	Slight	Slight	Moderate: slope.	Slight	Slight.
164A, 164B Stoy	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.
164C2 Stoy	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness.
165 Weir	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
214B Hosmer	Severe: percs slowly.	Severe: percs slowly.	Severe: percs slowly.	Severe: erodes easily.	Moderate: wetness.
214C2, 214C3 Hosmer	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: wetness.
214D, 214D3 Hosmer	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: wetness, slope.
308B2 Alford	Slight	Slight	Moderate: slope.	Slight	Slight.
308C2 Alford	Slight	Slight	Severe: slope.	Slight	Slight.
338A Hurst	Severe: wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
432B Geff	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
453B Muren	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Severe: erodes easily.	Slight.
453C2 Muren	Moderate: wetness.	Moderate: wetness.	Severe: slope.	Severe: erodes easily.	Slight.
474 Piasa	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
517A Marine	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
533. Urban land					
584C2, 584C3: Grantfork	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness.
584D2: Grantfork	Severe: wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness, slope.
621B2: Coulterville	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.
621C3: Coulterville	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness.
801B: Orthents	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Severe: erodes easily.	Slight.
821C: Morristown	Moderate: percs slowly.	Moderate: percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: droughty.
821G: Morristown	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: droughty, slope.
850D3:					
Hickory	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Hosmer	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: wetness, slope.
880A, 880B2:					
Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Severe: excess sodium.
Coulterville	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.
900E:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Wellston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
900G:					
Wellston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
909A, 909B:					
Coulterville	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Severe: erodes easily.	Moderate: wetness.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
909A, 909B:					
Oconee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
912A, 912B2:					
Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Severe: excess sodium.
Hoyleton	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
916A, 916B2:					
Darmstadt	Severe: wetness, percs slowly, excess sodium.	Severe: excess sodium, percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Severe: excess sodium.
Oconee	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
920:					
Huey	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
Rushville	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.
929D3:					
Hickory	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
Ava	Severe: percs slowly.	Severe: percs slowly.	Severe: slope, percs slowly.	Severe: erodes easily.	Moderate: wetness, slope.
934D3:					
Blair	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: wetness, slope.
Grantfork	Severe: wetness.	Moderate: slope, wetness, percs slowly.	Severe: slope, wetness.	Severe: erodes easily.	Moderate: wetness, slope.
941:					
Piasa	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
Virden	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
991:					
Huey	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
Cisne	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
993:					
Piasa	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly, excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
Cowden	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
995:					
Piasa	Severe: ponding, percs slowly, excess sodium.	Severe: ponding, excess sodium, percs slowly.	Severe: ponding, percs slowly; excess sodium.	Severe: ponding.	Severe: excess sodium, ponding.
Herrick	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
1288 Petrolia	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
1334 Birds	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
3084 Okaw	Severe: flooding, ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, flooding, percs slowly.	Severe: ponding.	Severe: ponding, flooding.
3108 Bonnie	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
3288 Petrolia	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
3333 Wakeland	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
3334 Birds	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
3336 Wilbur	Severe: flooding.	Moderate: flooding, wetness.	Severe: flooding.	Moderate: wetness, flooding.	Severe: flooding.
3382 Belknap	Severe: flooding, wetness.	Moderate: flooding, wetness, percs slowly.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
3415 Orion	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
3787 Banlic	Severe: flooding, wetness.	Moderate: flooding, wetness, percs slowly.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
7084 Okaw	Severe: flooding, ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.

Table 9.--Recreational Development--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
7122B----------------- Colp	Severe: flooding.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: erodes easily.	Slight.
7337A----------------- Creal	Severe: flooding, wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
7338A----------------- Hurst	Severe: flooding, wetness, percs slowly.	Severe: percs slowly.	Severe: wetness, percs slowly.	Severe: erodes easily.	Moderate: wetness.
8109------------------ Racoon	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Table 10.--Wildlife Habitat

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
2------------------ Cisne	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
3A----------------- Hoyleton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
3B----------------- Hoyleton	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
4B----------------- Richview	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
4C2---------------- Richview	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
5C2, 5C3, 5D, 5D3-- Blair	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
7D3---------------- Atlas	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
8D2, 8D3----------- Hickory	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
8E, 8E3------------ Hickory	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
8G----------------- Hickory	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
12----------------- Wynoose	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
13A---------------- Bluford	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
13B, 13B2---------- Bluford	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
14B, 14C2, 14C3---- Ava	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
16----------------- Rushville	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
46A---------------- Herrick	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
48----------------- Ebbert	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
50----------------- Virden	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Good.
84----------------- Okaw	Fair	Fair	Fair	Fair	Poor	Good	Fair	Fair	Fair	Fair.
112---------------- Cowden	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
113A--------------- Oconee	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
113B--------------- Oconee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
120-----------------Huey	Poor	Poor	Poor	Fair	Fair	Good	Good	Poor	Fair	Good.
127B----------------Harrison	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
164A----------------Stoy	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
164B----------------Stoy	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
164C2---------------Stoy	Fair	Good	Good	Good	Good	Poor	Very poor.	Very poor.	Good	Very poor.
165-----------------Weir	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
214B----------------Hosmer	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
214C2, 214C3--------Hosmer	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
214D, 214D3---------Hosmer	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
308B2---------------Alford	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
308C2---------------Alford	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
338A----------------Hurst	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair.
432B----------------Geff	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
453B, 453C2---------Muren	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
474-----------------Piasa	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
517A----------------Marine	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
533. Urban land										
584C2, 584C3--------Grantfork	Fair	Good	Fair	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
584D2---------------Grantfork	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
621B2---------------Coulterville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
621C3---------------Coulterville	Fair	Good	Good	Good	Good	---	Fair	Good	Good	Fair.
801B----------------Orthents	Good	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
821C----------------Morristown	Fair	Fair	Fair	Fair	Fair	Poor	Very poor.	Fair	Fair	Very poor.
821G----------------Morristown	Very poor.	Very poor.	Poor	Poor	Poor	Very poor.	Very poor.	Very poor.	Poor	Very poor.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
850D3:										
Hickory	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Hosmer	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
880A:										
Darmstadt	Fair	Good	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Coulterville	Fair	Good	Good	Good	Good	Poor	Fair	Good	Good	Fair.
880B2:										
Darmstadt	Fair	Good	Fair	Good	Good	Fair	Very poor.	Fair	Good	Very poor.
Coulterville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
900E:										
Hickory	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Wellston	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
900G:										
Wellston	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
Hickory	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
909A:										
Coulterville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Oconee	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
909B:										
Coulterville	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Oconee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
912A:										
Darmstadt	Fair	Good	Poor	Good	Good	Fair	Fair	Fair	Good	Fair.
Hoyleton	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
912B2:										
Darmstadt	Fair	Good	Poor	Good	Good	Fair	Poor	Fair	Good	Poor.
Hoyleton	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
916A:										
Darmstadt	Fair	Good	Poor	Good	Good	Fair	Fair	Fair	Good	Fair.
Oconee	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
916B2:										
Darmstadt	Fair	Good	Poor	Good	Good	Fair	Poor	Fair	Good	Poor.
Oconee	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
920:										
Huey	Poor	Poor	Poor	Fair	Fair	Good	Good	Poor	Fair	Good.
Rushville	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
929D3:										
Hickory	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Ava	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
934D3:										
Blair	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Grantfork	Poor	Fair	Fair	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
941:										
Piasa	Poor	Fair	Fair	Poor	Poor	Good	Good	Poor	Poor	Good.
Virden	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
991:										
Huey	Poor	Poor	Poor	Fair	Fair	Good	Good	Poor	Fair	Good.
Cisne	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
993:										
Piasa	Poor	Fair	Fair	Poor	Fair	Good	Good	Fair	Fair	Good.
Cowden	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
995:										
Piasa	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
Herrick	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
1288 Petrolia	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
1334 Birds	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3084 Okaw	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
3108 Bonnie	Poor	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.
3288 Petrolia	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
3333 Wakeland	Poor	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
3334 Birds	Poor	Fair	Good	Fair	Fair	Good	Good	Fair	Good	Good.
3336 Wilbur	Poor	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
3382 Belknap	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
3415 Orion	Poor	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
3787 Banlic	Fair	Good	Good	Good	Good	Fair	Good	Good	Good	Fair.
7084 Okaw	Fair	Fair	Fair	Fair	Poor	Good	Good	Fair	Fair	Good.

Table 10.--Wildlife Habitat--Continued

Soil name and map symbol	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
7122B--------------- Colp	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
7337A--------------- Creal	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
7338A--------------- Hurst	Fair	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair.
8109---------------- Racoon	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

Table 11.--Building Site Development

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2----------------- Cisne	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
3A, 3B------------ Hoyleton	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
4B---------------- Richview	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
4C2--------------- Richview	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
5C2, 5C3---------- Blair	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Moderate: wetness.
5D, 5D3----------- Blair	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
7D3--------------- Atlas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: wetness, droughty, slope.
8D2, 8D3---------- Hickory	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
8E, 8E3, 8G------- Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
12---------------- Wynoose	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
13A, 13B, 13B2---- Bluford	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
14B--------------- Ava	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Moderate: wetness.
14C2, 14C3-------- Ava	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Moderate: wetness.
16---------------- Rushville	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
46A--------------- Herrick	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
48---------------- Ebbert	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
50---------------- Virden	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
84---------------- Okaw	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
112--------------- Cowden	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
113A, 113B-------- Oconee	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
120--------------- Huey	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: excess sodium, ponding.
127B-------------- Harrison	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
164A, 164B, 164C2- Stoy	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
165--------------- Weir	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
214B-------------- Hosmer	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: frost action.	Moderate: wetness.
214C2, 214C3------ Hosmer	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: frost action.	Moderate: wetness.
214D, 214D3------- Hosmer	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: wetness, slope.
308B2------------- Alford	Slight-----------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
308C2------------- Alford	Slight-----------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
338A-------------- Hurst	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
432B-------------- Geff	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
453B-------------- Muren	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
453C2------------- Muren	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: low strength, frost action.	Slight.
474--------------- Piasa	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: excess sodium, ponding.
517A-------------- Marine	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
533. Urban land						
584C2, 584C3------ Grantfork	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
584D2------------- Grantfork	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
621B2, 621C3------ Coulterville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
801B-------------- Orthents	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
821C-------------- Morristown	Moderate: dense layer.	Severe: unstable fill.	Severe: unstable fill.	Severe: unstable fill.	Severe: unstable fill.	Moderate: droughty.
821G-------------- Morristown	Severe: slope.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: droughty, slope.
850D3: Hickory-----------	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Hosmer-----------	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: frost action.	Moderate: wetness, slope.
880A, 880B2: Darmstadt--------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
Coulterville-----	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
900E:						
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Wellston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
900G:						
Wellston	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
909A, 909B:						
Coulterville	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
Oconee	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
912A, 912B2:						
Darmstadt	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
Hoyleton	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
916A, 916B2:						
Darmstadt	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Severe: excess sodium.
Oconee	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, frost action, shrink-swell.	Moderate: wetness.
920:						
Huey	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: excess sodium, ponding.
Rushville	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
929D3:						
Hickory	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Ava	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength, frost action.	Moderate: wetness, slope.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
934D3:						
Blair	Severe: wetness.	Moderate: wetness, shrink-swell, slope.	Severe: wetness.	Severe: slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
Grantfork	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, slope.	Severe: low strength, frost action.	Moderate: wetness, slope.
941:						
Piasa	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: excess sodium, ponding.
Virden	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
991:						
Huey	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: excess sodium, ponding.
Cisne	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
993:						
Piasa	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: excess sodium, ponding.
Cowden	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
995:						
Piasa	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: excess sodium, ponding.
Herrick	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
1288 Petrolia	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
1334 Birds	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
3084 Okaw	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding, flooding.

Table 11.--Building Site Development--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
3108-------------- Bonnie	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
3288-------------- Petrolia	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
3333-------------- Wakeland	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
3334-------------- Birds	Severe: ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
3336-------------- Wilbur	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding, frost action.	Severe: flooding.
3382-------------- Belknap	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
3415-------------- Orion	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Severe: flooding.
3787-------------- Banlic	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: flooding.
7084-------------- Okaw	Severe: ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding.
7122B------------- Colp	Severe: wetness.	Severe: flooding, shrink-swell.	Severe: flooding, wetness.	Severe: flooding, shrink-swell.	Severe: shrink-swell, low strength.	Slight.
7337A------------- Creal	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: frost action.	Moderate: wetness.
7338A------------- Hurst	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, low strength.	Moderate: wetness.
8109-------------- Racoon	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding, shrink-swell.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding.

Table 12.--Sanitary Facilities

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2: Cisne	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
3A: Hoyleton	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
3B: Hoyleton	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
4B: Richview	Moderate: wetness, percs slowly.	Moderate: seepage, slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
4C2: Richview	Moderate: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey.
5C2, 5C3: Blair	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
5D, 5D3: Blair	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, slope, wetness.
7D3: Atlas	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
8D2, 8D3: Hickory	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
8E, 8E3, 8G: Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
12: Wynoose	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
13A: Bluford	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
13B, 13B2: Bluford	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
14B: Ava	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
14C2, 14C3: Ava	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
16------------------ Rushville	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
46A----------------- Herrick	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
48------------------ Ebbert	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: hard to pack, ponding.
50------------------ Virden	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
84------------------ Okaw	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
112----------------- Cowden	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
113A---------------- Oconee	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
113B---------------- Oconee	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
120----------------- Huey	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, ponding, excess sodium.
127B---------------- Harrison	Severe: wetness.	Severe: wetness.	Moderate: wetness, too clayey.	Slight-----------	Fair: too clayey, wetness.
164A---------------- Stoy	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
164B---------------- Stoy	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
164C2--------------- Stoy	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
165----------------- Weir	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
214B---------------- Hosmer	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
214C2, 214C3-------- Hosmer	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
214D, 214D3: Hosmer	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
308B2: Alford	Slight	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
308C2: Alford	Slight	Severe: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
338A: Hurst	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
432B: Geff	Severe: wetness.	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness.	Poor: wetness.
453B: Muren	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
453C2: Muren	Severe: wetness.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
474: Piasa	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
517A: Marine	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
533. Urban land					
584C2, 584C3, 584D2: Grantfork	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
621B2: Coulterville	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
621C3: Coulterville	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
801B: Orthents	Severe: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Slight	Fair: wetness.
821C: Morristown	Severe: percs slowly, unstable fill.	Severe: slope, unstable fill.	Severe: unstable fill.	Severe: unstable fill.	Fair: too clayey.
821G: Morristown	Severe: percs slowly, slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Severe: slope, unstable fill.	Poor: small stones, slope.
850D3: Hickory	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
850D3:					
Hosmer	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
880A:					
Darmstadt	Severe: wetness, percs slowly.	Slight	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
Coulterville	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
880B2:					
Darmstadt	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
Coulterville	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
900E:					
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Wellston	Severe: slope.	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Poor: slope.
900G:					
Wellston	Severe: slope.	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Poor: slope.
Hickory	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
909A:					
Coulterville	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
Oconee	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
909B:					
Coulterville	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Oconee	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
912A:					
Darmstadt	Severe: wetness, percs slowly.	Slight	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
Hoyleton	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
912B2:					
Darmstadt	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
Hoyleton	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
916A:					
Darmstadt	Severe: wetness, percs slowly.	Slight	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
Oconee	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
916B2:					
Darmstadt	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, excess sodium.	Severe: wetness.	Poor: wetness, excess sodium.
Oconee	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
920:					
Huey	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, ponding, excess sodium.
Rushville	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
929D3:					
Hickory	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, small stones, slope.
Ava	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Moderate: wetness, slope.	Fair: too clayey, slope, wetness.
934D3:					
Blair	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, slope, wetness.
Grantfork	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness.	Severe: wetness.	Poor: wetness.
941:					
Piasa	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Virden	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
991:					
Huey	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, ponding, excess sodium.
Cisne	Severe: wetness, percs slowly.	Slight	Severe: wetness.	Severe: wetness.	Poor: wetness.
993:					
Piasa	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Cowden	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
995:					
Piasa	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey, excess sodium.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
Herrick	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
1288 Petrolia	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
1334 Birds	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3084 Okaw	Severe: flooding, ponding, percs slowly.	Severe: flooding.	Severe: flooding, ponding, too clayey.	Severe: flooding, ponding.	Poor: too clayey, hard to pack, ponding.
3108 Bonnie	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3288 Petrolia	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3333 Wakeland	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3334 Birds	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
3336 Wilbur	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.

Table 12.--Sanitary Facilities--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
3382: Belknap	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3415: Orion	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
3787: Banlic	Severe: flooding, wetness, percs slowly.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
7084: Okaw	Severe: ponding, percs slowly.	Slight	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
7122B: Colp	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
7337A: Creal	Severe: wetness, percs slowly.	Severe: wetness.	Severe: cemented pan, wetness.	Severe: wetness.	Poor: wetness.
7338A: Hurst	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
8109: Racoon	Severe: flooding, ponding, percs slowly.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.

Table 13.--Construction Materials

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
2: Cisne	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
3A, 3B: Hoyleton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
4B, 4C2: Richview	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
5C2, 5C3: Blair	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
5D, 5D3: Blair	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
7D3: Atlas	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
8D2, 8D3: Hickory	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
8E, 8E3: Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
8G: Hickory	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
12: Wynoose	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
13A, 13B, 13B2: Bluford	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
14B, 14C2, 14C3: Ava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
16: Rushville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
46A: Herrick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
48: Ebbert	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
50: Virden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
84: Okaw	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
112: Cowden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

Table 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
113A, 113B: Oconee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
120: Huey	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness, excess sodium.
127B: Harrison	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
164A, 164B, 164C2: Stoy	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
165: Weir	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
214B, 214C2, 214C3: Hosmer	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
214D, 214D3: Hosmer	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
308B2, 308C2: Alford	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
338A: Hurst	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
432B: Geff	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too clayey, small stones.
453B, 453C2: Muren	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
474: Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
517A: Marine	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
533. Urban land				
584C2, 584C3: Grantfork	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
584D2: Grantfork	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
621B2, 621C3: Coulterville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
801B: Orthents	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
821C: Morristown	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim.
821G: Morristown	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.

Table 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
850D3:				
Hickory	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Hosmer	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
880A, 880B2:				
Darmstadt	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
Coulterville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
900E:				
Hickory	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Wellston	Fair: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
900G:				
Wellston	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Hickory	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
909A, 909B:				
Coulterville	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
Oconee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
912A, 912B2:				
Darmstadt	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
Hoyleton	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
916A, 916B2:				
Darmstadt	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, excess sodium.
Oconee	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
920:				
Huey	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness, excess sodium.
Rushville	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.

Table 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
929D3:				
Hickory	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Ava	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
934D3:				
Blair	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Grantfork	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
941:				
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
Virden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
991:				
Huey	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness, excess sodium.
Cisne	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
993:				
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
Cowden	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
995:				
Piasa	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess sodium.
Herrick	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
1288 Petrolia	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1334 Birds	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3084 Okaw	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
3108 Bonnie	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

Table 13.--Construction Materials--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
3288: Petrolia	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3333: Wakeland	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
3334: Birds	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
3336: Wilbur	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
3382: Belknap	Fair: thin layer, wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
3415: Orion	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
3787: Banlic	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
7084: Okaw	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
7122B: Colp	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
7337A: Creal	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
7338A: Hurst	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
8109: Racoon	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

Table 14.--Water Management

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
2-----------------Cisne	Slight---------	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
3A----------------Hoyleton	Slight---------	Severe: thin layer, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
3B----------------Hoyleton	Moderate: slope.	Severe: thin layer, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
4B, 4C2-----------Richview	Moderate: seepage, slope.	Slight---------	Deep to water	Slope----------	Erodes easily	Erodes easily.
5C2, 5C3----------Blair	Moderate: slope.	Severe: wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
5D, 5D3-----------Blair	Severe: slope.	Severe: wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Slope, erodes easily, wetness.	Slope, erodes easily.
7D3---------------Atlas	Severe: slope.	Severe: hard to pack.	Percs slowly, frost action, slope.	Slope, wetness, droughty.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
8D2, 8D3, 8E, 8E3, 8G---------------Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
12----------------Wynoose	Slight---------	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
13A---------------Bluford	Slight---------	Severe: piping.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
13B, 13B2---------Bluford	Moderate: slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
14B, 14C2, 14C3---Ava	Moderate: seepage, slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, rooting depth.
16----------------Rushville	Slight---------	Severe: ponding, hard to pack.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
46A---------------Herrick	Slight---------	Severe: wetness.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, erodes easily.
48----------------Ebbert	Slight---------	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
50----------------Virden	Slight---------	Severe: ponding.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
84----------------Okaw	Slight---------	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
112 Cowden	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
113A Oconee	Slight	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
113B Oconee	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
120 Huey	Slight	Severe: ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, droughty, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
127B Harrison	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope	Erodes easily	Erodes easily.
164A Stoy	Slight	Moderate: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
164B, 164C2 Stoy	Moderate: slope.	Moderate: wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
165 Weir	Slight	Severe: ponding.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
214B, 214C2, 214C3 Hosmer	Moderate: seepage, slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, rooting depth.
214D, 214D3 Hosmer	Severe: slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
308B2, 308C2 Alford	Moderate: seepage, slope.	Moderate: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
338A Hurst	Slight	Severe: wetness.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
432B Geff	Moderate: seepage, slope.	Severe: piping, wetness.	Frost action, slope.	Slope, wetness, rooting depth.	Erodes easily, wetness.	Wetness, erodes easily, rooting depth.
453B, 453C2 Muren	Moderate: seepage, slope.	Moderate: thin layer, piping, wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
474 Piasa	Slight	Severe: hard to pack, ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
517A Marine	Slight	Moderate: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
533. Urban land						
584C2, 584C3 Grantfork	Moderate: slope.	Moderate: piping, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
584D2 Grantfork	Severe: slope.	Moderate: piping, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
621B2, 621C3 Coulterville	Moderate: slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
801B Orthents	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily	Erodes easily	Erodes easily.
821C Morristown	Moderate: slope.	Severe: piping.	Deep to water	Slope, droughty, rooting depth.	Large stones, erodes easily.	Large stones, erodes easily.
821G Morristown	Severe: slope.	Severe: piping.	Deep to water	Slope, droughty, rooting depth.	Slope, large stones.	Large stones, slope, droughty.
850D3:						
Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Hosmer	Severe: slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
880A:						
Darmstadt	Slight	Severe: excess sodium.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.
Coulterville	Slight	Severe: piping.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
880B2:						
Darmstadt	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.
Coulterville	Moderate: slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
900E:						
Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Wellston	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
900G:						
Wellston	Severe: slope.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
909A:						
Coulterville	Slight	Severe: piping.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
Oconee	Slight	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
909B:						
Coulterville	Moderate: slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
909B:						
Oconee	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
912A:						
Darmstadt	Slight	Severe: excess sodium.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.
Hoyleton	Slight	Severe: thin layer, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
912B2:						
Darmstadt	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.
Hoyleton	Moderate: slope.	Severe: thin layer, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
916A:						
Darmstadt	Slight	Severe: excess sodium.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.
Oconee	Slight	Severe: hard to pack, wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
916B2:						
Darmstadt	Moderate: slope.	Severe: excess sodium.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Wetness, excess sodium.
Oconee	Moderate: slope.	Severe: hard to pack, wetness.	Percs slowly, frost action, slope.	Wetness, percs slowly, slope.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
920:						
Huey	Slight	Severe: ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, droughty, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
Rushville	Slight	Severe: ponding, hard to pack.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
929D3:						
Hickory	Severe: slope.	Moderate: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Ava	Severe: slope.	Severe: piping.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
934D3:						
Blair	Severe: slope.	Severe: wetness.	Frost action, slope.	Slope, wetness, erodes easily.	Slope, erodes easily, wetness.	Slope, erodes easily.
Grantfork	Severe: slope.	Moderate: piping, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Wetness, slope, erodes easily.
941:						
Piasa	Slight	Severe: hard to pack, ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
941:						
Virden	Slight	Severe: ponding.	Ponding, frost action.	Ponding	Ponding	Wetness.
991:						
Huey	Slight	Severe: ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, droughty, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
Cisne	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
993:						
Piasa	Slight	Severe: hard to pack, ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
Cowden	Slight	Severe: wetness.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
995:						
Piasa	Slight	Severe: hard to pack, ponding, excess sodium.	Ponding, percs slowly, frost action.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, excess sodium, erodes easily.
Herrick	Slight	Severe: wetness.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
1288 Petrolia	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.
1334 Birds	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
3084 Okaw	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly, flooding.	Ponding, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
3108 Bonnie	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
3288 Petrolia	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding	Wetness.
3333 Wakeland	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
3334 Birds	Slight	Severe: ponding.	Ponding, flooding, frost action.	Ponding, erodes easily, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
3336 Wilbur	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
3382 Belknap	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
3415 Orion	Moderate: seepage.	Severe: piping, wetness.	Flooding, frost action.	Wetness	Erodes easily, wetness.	Wetness, erodes easily.

Table 14.--Water Management--Continued

Soil name and map symbol	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
3787 Banlic	Slight	Severe: piping.	Percs slowly, flooding, frost action.	Wetness, percs slowly, rooting depth.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, rooting depth.
7084 Okaw	Slight	Severe: hard to pack, ponding.	Ponding, percs slowly.	Ponding, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
7122B Colp	Moderate: slope.	Moderate: hard to pack, wetness.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
7337A Creal	Slight	Severe: thin layer, wetness.	Frost action	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
7338A Hurst	Slight	Severe: wetness.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness.	Wetness, erodes easily.
8109 Racoon	Slight	Severe: thin layer, ponding.	Ponding, percs slowly, flooding.	Ponding, percs slowly, erodes easily.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.

Table 15.--Engineering Index Properties

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
2------------- Cisne	0-8	Silt loam-----	CL, CL-ML, ML	A-4	0	0	100	100	90-100	90-100	25-35	5-10
	8-17	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	17-48	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	90-100	90-100	45-60	20-35
	48-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	100	90-100	70-95	50-90	30-50	15-30
3A, 3B-------- Hoyleton	0-15	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	5-15
	15-46	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	20-30
	46-60	Silt loam, loam, clay loam.	CL, CL-ML	A-6, A-7, A-4	0	0	100	95-100	90-100	70-95	20-45	5-25
4B, 4C2------- Richview	0-13	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	13-42	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	15-30
	42-60	Silt loam, loam, clay loam.	CL	A-6, A-7	0	0	100	90-100	90-100	70-95	25-45	10-20
5C2----------- Blair	0-6	Silt loam-----	CL-ML, CL	A-4, A-6	0	0-2	95-100	90-100	90-100	85-95	20-35	5-15
	6-38	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	90-100	80-100	30-50	15-30
	38-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-95	30-50	15-30
5C3----------- Blair	0-3	Silt loam-----	CL-ML, CL	A-4, A-6	0	0-2	95-100	90-100	90-100	85-95	20-35	5-15
	3-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-95	30-50	15-30
5D------------ Blair	0-5	Silt loam-----	CL-ML, CL	A-4, A-6	0	0-2	95-100	90-100	90-100	85-95	20-35	5-15
	5-20	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	90-100	80-100	30-50	15-30
	20-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-95	30-50	15-30
5D3----------- Blair	0-3	Silt loam-----	CL-ML, CL	A-4, A-6	0	0-2	95-100	90-100	90-100	85-95	20-35	5-15
	3-37	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	90-100	80-100	30-50	15-30
	37-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-95	30-50	15-30

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
7D3----------- Atlas	0-7	Silty clay loam.	CH, CL	A-7	0	0	100	100	95-100	75-100	40-60	25-40
	7-37	Silty clay loam, clay, clay loam.	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
	37-60	Silty clay loam, clay, clay loam.	CH	A-7	0	0	100	95-100	95-100	75-95	50-70	30-45
8D2----------- Hickory	0-6	Silt loam-----	CL	A-6, A-4	0	0-5	95-100	90-100	90-100	75-95	20-35	8-15
	6-60	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
8D3----------- Hickory	0-5	Silty clay loam.	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	70-85	30-50	15-30
	5-41	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	41-60	Sandy loam, loam, gravelly clay loam.	CL-ML, CL	A-4, A-6	0-1	0-5	85-100	75-95	70-95	60-80	20-40	5-20
8E------------ Hickory	0-12	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	12-60	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
8E3----------- Hickory	0-4	Clay loam-----	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	70-85	30-50	15-30
	4-54	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	54-60	Sandy loam, loam, gravelly clay loam.	CL-ML, CL	A-4, A-6	0-1	0-5	85-100	75-95	70-95	60-80	20-40	5-20
8G------------ Hickory	0-10	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	10-60	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
12------------ Wynoose	0-8	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-95	20-35	5-15
	8-21	Silt loam-----	CL, ML, CL-ML	A-4, A-6	0	0	100	100	95-100	85-95	15-30	2-15
	21-54	Silty clay, silty clay loam.	CL, CH	A-7	0	0	100	100	95-100	85-95	40-55	20-35
	54-60	Silt loam, clay loam, silty clay loam.	CL	A-6, A-7	0	0	100	95-100	90-100	70-90	30-45	15-25

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
13A, 13B: Bluford	0-6	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	95-100	95-100	90-100	20-35	5-15
	6-13	Silt loam	ML, CL-ML, CL	A-4	0	0	100	95-100	95-100	90-100	20-30	NP-10
	13-37	Silty clay loam, silty clay.	CL	A-7, A-6	0	0	100	95-100	95-100	90-100	35-50	15-30
	37-60	Silt loam, loam, clay loam.	CL-ML, CL	A-6, A-4	---	0-5	100	95-100	90-100	70-90	25-40	5-20
13B2: Bluford	0-5	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	95-100	95-100	90-100	20-35	5-15
	5-22	Silty clay loam, silty clay.	CL	A-7, A-6	0	0	100	95-100	95-100	90-100	35-50	15-30
	22-60	Silt loam, loam, clay loam.	CL-ML, CL	A-6, A-4	---	0-5	100	95-100	90-100	70-90	25-40	5-20
14B, 14C2: Ava	0-13	Silt loam	CL, ML, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	25-35	5-15
	13-16	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	16-34	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	34-54	Silty clay loam, loam, clay loam.	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	95-100	90-100	80-90	20-45	5-20
	54-60	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0	100	95-100	90-100	80-90	25-40	5-20
14C3: Ava	0-4	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	4-29	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	29-51	Silty clay loam, loam, clay loam.	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	95-100	90-100	80-90	20-45	5-20
	51-60	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0	100	95-100	90-100	80-90	25-40	5-20
16: Rushville	0-10	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	NP-15
	10-20	Silt loam, silt.	ML, CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	20-40	NP-15
	20-45	Silty clay loam, silty clay.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	45-60	20-35
	45-60	Silt loam, silty clay loam.	CL	A-4, A-6, A-7-6	0	0	100	100	95-100	90-100	30-45	8-20
46A: Herrick	0-19	Silt loam	CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	30-40	5-15
	19-27	Silty clay loam, silty clay.	CH, CL	A-7-6	0	0	100	100	95-100	90-100	45-60	25-40
	27-53	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	0	100	100	95-100	90-100	35-50	20-35
	53-60	Silt loam, loam, clay loam.	CL	A-6	0	0	100	100	90-100	80-100	30-40	10-20

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
48------------ Ebbert	0-12	Silt loam-----	CL	A-6	0	0	100	100	95-100	85-100	30-40	10-15
	12-22	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	7-15
	22-60	Silty clay loam, silt loam.	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	25-35
50------------ Virden	0-14	Silt loam-----	CL	A-7, A-6	0	0	100	100	95-100	95-100	30-45	10-20
	14-54	Silty clay, silty clay loam.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	40-55	15-30
	54-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	0	100	100	95-100	90-100	30-45	10-20
84------------ Okaw	0-15	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	15-42	Silty clay, clay, silty clay loam.	CH	A-7	0	0	100	100	95-100	90-100	50-70	30-50
	42-60	Silty clay, clay, silty clay loam.	CH, CL	A-7	0	0	100	100	95-100	90-100	45-60	20-35
112----------- Cowden	0-9	Silt loam-----	CL-ML, CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	3-15
	9-16	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	16-50	Silty clay loam, silty clay.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	45-60	20-32
	50-60	Silt loam-----	CL	A-6, A-7-6	0	0	100	100	95-100	95-100	30-45	10-20
113A, 113B---- Oconee	0-9	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-40	3-20
	9-19	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	8-20
	19-43	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-65	20-45
	43-60	Silt loam-----	CL	A-4, A-6, A-7-6	0	0	100	100	90-100	85-100	20-45	8-25
120----------- Huey	0-8	Silt loam-----	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-95	20-35	3-15
	8-14	Silt, silt loam.	CL, ML, CL-ML	A-6, A-4	0	0	100	100	90-100	85-95	15-30	3-15
	14-22	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-25
	22-52	Silt loam, silty clay loam, silty clay.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	15-30
	52-60	Loam, silt loam, silty clay loam.	CL	A-6	0	0	95-100	90-100	80-95	65-90	20-35	10-20
127B---------- Harrison	0-16	Silt loam-----	CL	A-4, A-6	0	0	100	100	100	95-100	30-40	8-15
	16-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	100	95-100	30-45	10-20
164A---------- Stoy	0-12	Silt loam-----	ML, CL	A-6	0	0	100	100	95-100	90-100	30-40	10-15
	12-38	Silty clay loam.	CL	A-7	0	0	100	100	95-100	90-100	40-50	22-32
	38-53	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	15-25
	53-60	Silt loam-----	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	13-25

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
164B----------Stoy	0-16	Silt loam-----	ML, CL	A-6	0	0	100	100	95-100	90-100	30-40	10-15
	16-37	Silty clay loam.	CL	A-7	0	0	100	100	95-100	90-100	40-50	22-32
	37-47	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	15-25
	47-60	Silt loam-----	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	13-25
164C2---------Stoy	0-6	Silt loam-----	ML, CL	A-6	0	0	100	100	95-100	90-100	30-40	10-15
	6-31	Silty clay loam.	CL	A-7	0	0	100	100	95-100	90-100	40-50	22-32
	31-41	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	35-50	15-25
	41-60	Silt loam-----	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	13-25
165-----------Weir	0-5	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	5-17
	5-14	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	100	95-100	90-100	<25	3-10
	14-47	Silty clay loam.	CL	A-7, A-6	0	0	100	100	95-100	90-100	35-50	15-30
	47-60	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-30	9-16
214B, 214C2---Hosmer	0-10	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	100	90-100	70-90	<25	3-10
	10-36	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-95	25-35	5-15
	36-60	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-95	20-30	5-15
214C3---------Hosmer	0-3	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	100	90-100	70-90	<25	3-10
	3-29	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-95	25-35	5-15
	29-60	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-95	20-30	5-15
214D----------Hosmer	0-11	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	100	90-100	70-90	<25	3-10
	11-35	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-95	25-35	5-15
	35-60	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-95	20-30	5-15
214D3---------Hosmer	0-4	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	100	90-100	70-90	<25	3-10
	4-30	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-95	25-35	5-15
	30-60	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-95	20-30	5-15
308B2, 308C2--Alford	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-100	20-30	5-15
	8-60	Silty clay loam, silt loam.	CL	A-6	0	0	100	100	90-100	80-100	30-40	10-20
338A----------Hurst	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	95-100	95-100	75-100	20-35	4-15
	8-16	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-35	5-15
	16-60	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-60	20-35

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct	Pct					Pct	
432B---------- Geff	0-8	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	95-100	95-100	20-35	4-15
	8-17	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	0	95-100	95-100	95-100	95-100	20-35	4-15
	17-33	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	95-100	95-100	90-100	90-100	35-45	15-25
	33-60	Stratified silty clay loam to sandy loam.	CL-ML, CL	A-4, A-6	0	0-2	90-100	80-100	70-100	50-90	15-30	4-15
453B, 453C2--- Muren	0-12	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-30	5-15
	12-54	Silty clay loam, silt loam.	CL	A-6, A-4	0	0	100	100	90-100	80-100	25-35	8-15
	54-60	Silt loam, silt.	CL, CL-ML, ML	A-4	0	0	100	100	90-100	70-90	<25	NP-10
474----------- Piasa	0-8	Silt loam-----	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	8-11	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	8-20
	11-37	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	0	100	100	95-100	95-100	40-55	15-25
	37-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-25
517A---------- Marine	0-14	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	20-35	5-15
	14-21	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	95-100	40-60	20-35
	21-60	Silty clay loam, silt loam.	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-100	30-45	8-20
533. Urban land												
584C2--------- Grantfork	0-6	Silt loam-----	CL	A-6	0	0	100	95-100	85-95	80-90	25-40	10-20
	6-28	Silty clay loam, clay loam, loam.	CL	A-6, A-7	0	0	100	90-100	80-90	70-80	30-45	10-20
	28-60	Clay loam, loam.	CL	A-6, A-7	0	0-5	95-100	85-95	70-80	55-75	25-45	10-25
584C3--------- Grantfork	0-4	Silty clay loam.	CL	A-6	0	0	100	95-100	85-95	80-90	30-40	10-20
	4-22	Silty clay loam, clay loam, loam.	CL	A-6, A-7	0	0	100	90-100	80-90	70-80	30-45	10-20
	22-60	Clay loam, loam.	CL	A-6, A-7	0	0-5	95-100	85-95	70-80	55-75	25-45	10-25
584D2--------- Grantfork	0-7	Silt loam-----	CL	A-6	0	0	100	95-100	85-95	80-90	25-40	10-20
	7-18	Silty clay loam, clay loam, loam.	CL	A-6, A-7	0	0	100	90-100	80-90	70-80	30-45	10-20
	18-60	Clay loam, loam.	CL	A-6, A-7	0	0-5	95-100	85-95	70-80	55-75	25-45	10-25
621B2--------- Coulterville	0-8	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-20
	8-24	Silty clay loam, silt loam.	ML, CL, CH, MH	A-6, A-7	0	0	100	100	95-100	90-100	35-55	10-30
	24-33	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-50	7-25
	33-60	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-95	25-45	5-25

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
621C3--------- Coulterville	0-4	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-30
	4-30	Silty clay loam, silt loam.	ML, CL, CH, MH	A-6, A-7	0	0	100	100	95-100	90-100	35-55	10-30
	30-38	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-50	7-25
	38-60	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-95	25-45	5-25
801B---------- Orthents	0-60	Silt loam-----	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-95	25-45	5-25
821C---------- Morristown	0-5	Silt loam-----	CL, CL-ML	A-4, A-6	---	0-5	90-100	80-100	70-100	51-90	20-40	4-18
	5-60	Very gravelly silty clay loam, very channery clay loam.	GM-GC, GC	A-7, A-6, A-4, A-2	---	10-25	35-75	---	8-21	0-20	25-50	4-24
821G---------- Morristown	0-4		CL, GC, SC, SC-SM	A-4, A-6	---	5-15	70-95	50-80	45-75	35-70	20-40	4-18
	4-60	Very gravelly silty clay loam, very cobbly sandy clay loam.	GC, CL, CL-ML, GM-GC	A-7, A-6, A-4, A-2	---	10-25	35-75	25-65	20-65	15-60	25-50	4-24
850D3: Hickory------	0-8	Silty clay loam.	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	70-85	30-50	15-30
	8-60	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
Hosmer-------	0-6	Silty clay loam.	CL	A-6	0	0	100	100	95-100	85-95	30-35	10-15
	6-34	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-95	25-35	5-15
	34-60	Silt loam, silty clay loam.	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	70-95	20-30	5-15
880A: Darmstadt----	0-13	Silt loam-----	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	13-17	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	17-41	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	41-60	Silt loam, silty clay loam, loam.	CL	A-6, A-7, A-4	0	0	95-100	95-100	90-100	75-100	20-50	7-30
Coulterville-	0-7	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-20
	7-12	Silty clay loam, silt loam.	ML, CL, CH, MH	A-6, A-7	0	0	100	100	95-100	90-100	35-55	10-30
	12-33	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-50	7-25
	33-60	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-95	25-45	5-25

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
880B2:												
Darmstadt----	0-5	Silt loam-----	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	5-14	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	14-26	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	26-60	Silt loam, silty clay loam, loam.	CL	A-6, A-7, A-4	0	0	95-100	95-100	90-100	75-100	20-50	7-30
Coulterville-	0-6	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-20
	6-32	Silty clay loam, silt loam.	ML, CL, CH, MH	A-6, A-7	0	0	100	100	95-100	90-100	35-55	10-30
	32-49	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-50	7-25
	49-60	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-95	25-45	5-25
900E:												
Hickory------	0-15	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	15-22	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	22-60	Sandy loam, loam, gravelly clay loam.	CL-ML, CL	A-4, A-6	0-1	0-5	85-100	75-95	70-95	60-80	20-40	5-20
Wellston-----	0-9	Silt loam-----	ML	A-4	0	0	95-100	90-100	85-100	70-95	25-35	3-10
	9-27	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	---	0-5	75-100	70-100	60-95	60-90	25-40	5-20
	27-47	Silt loam, loam, gravelly loam.	CL-ML, CL, SC, SC-SM	A-4, A-6	---	0-10	65-90	65-90	60-90	40-65	20-35	5-15
	47	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
900G:												
Wellston-----	0-7	Silt loam-----	ML	A-4	0	0	95-100	90-100	85-100	70-95	25-35	3-10
	7-11	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	---	0-5	75-100	70-100	60-95	60-90	25-40	5-20
	11-48	Silt loam, loam, gravelly loam.	CL-ML, CL, SC, SC-SM	A-4, A-6	---	0-10	65-90	65-90	60-90	40-65	20-35	5-15
	48	Weathered bedrock.	---	---	---	---	---	---	---	---	---	---
Hickory------	0-19	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0-5	95-100	90-100	90-100	75-95	20-35	3-15
	19-50	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
	50-60	Sandy loam, loam, gravelly clay loam.	CL-ML, CL	A-4, A-6	0-1	0-5	85-100	75-95	70-95	60-80	20-40	5-20

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
909A, 909B:												
Coulterville	0-14	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-20
	14-31	Silty clay loam, silt loam.	ML, CL, CH, MH	A-6, A-7	0	0	100	100	95-100	90-100	35-55	10-30
	31-47	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	0	0	100	100	95-100	90-100	30-50	7-25
	47-60	Silt loam, silty clay loam.	CL-ML, CL	A-4, A-6, A-7	0	0	100	100	90-100	80-95	25-45	5-25
Oconee	0-10	Silt loam	CL, ML, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-40	3-20
	10-14	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	8-20
	14-32	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-65	20-45
	32-48	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-25
	48-60	Silt loam	CL	A-4, A-6, A-7-6	0	0	100	100	90-100	85-100	20-45	8-25
912A:												
Darmstadt	0-18	Silt loam	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	18-32	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	32-36	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	36-60	Silt loam, silty clay loam, loam.	CL	A-6, A-7, A-4	0	0	95-100	95-100	90-100	75-100	20-50	7-30
Hoyleton	0-8	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	5-15
	8-16	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	16-38	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	20-30
	38-60	Silt loam, loam, clay loam.	CL, CL-ML	A-6, A-7, A-4	0	0	100	95-100	90-100	70-95	20-45	5-25
912B2:												
Darmstadt	0-7	Silt loam	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	7-13	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	13-18	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	18-60	Silt loam, silty clay loam, loam.	CL	A-6, A-7, A-4	0	0	95-100	95-100	90-100	75-100	20-50	7-30
Hoyleton	0-7	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	5-15
	7-32	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	85-100	40-55	20-30
	32-60	Silt loam, loam, clay loam.	CL, CL-ML	A-6, A-7, A-4	0	0	100	95-100	90-100	70-95	20-45	5-25

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number-- 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
916A:												
Darmstadt----	0-12	Silt loam-----	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	12-19	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	19-55	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	55-60	Silt loam, silty clay loam, loam.	CL	A-6, A-7, A-4	0	0	95-100	95-100	90-100	75-100	20-50	7-30
Oconee-------	0-8	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-40	3-20
	8-19	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-35	8-20
	19-35	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-65	20-45
	35-57	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-25
	57-60	Silt loam-----	CL	A-4, A-6, A-7-6	0	0	100	100	90-100	85-100	20-45	8-25
916B2:												
Darmstadt----	0-8	Silt loam-----	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	95-100	75-100	25-45	5-20
	8-14	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	14-29	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	95-100	95-100	90-100	40-65	20-40
	29-60	Silt loam, silty clay loam, loam.	CL	A-6, A-7, A-4	0	0	95-100	95-100	90-100	75-100	20-50	7-30
Oconee-------	0-8	Silt loam-----	CL, ML, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-40	3-20
	8-37	Silty clay loam, silty clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-65	20-45
	37-48	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	10-25
	48-60	Silt loam-----	CL	A-4, A-6, A-7-6	0	0	100	100	90-100	85-100	20-45	8-25
920:												
Huey---------	0-8	Silt loam-----	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-95	20-35	3-15
	8-15	Silt, silt loam.	CL, ML, CL-ML	A-6, A-4	0	0	100	100	90-100	85-95	15-30	3-15
	15-60	Silt loam, silty clay loam, silty clay.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	15-30

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
920:												
Rushville----	0-8	Silt loam-----	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	NP-15
	8-16	Silt loam, silt.	ML, CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	20-40	NP-15
	16-48	Silty clay loam, silty clay.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	45-60	20-35
	48-57	Silty clay loam, silty clay.	CH, CL, ML, MH	A-7-6, A-7-5	0	0	100	100	95-100	95-100	45-60	15-30
	57-60	Silt loam, silty clay loam.	CL	A-4, A-6, A-7-6	0	0	100	100	95-100	90-100	30-45	8-20
929D3:												
Hickory------	0-8	Silty clay loam.	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	70-85	30-50	15-30
	8-60	Clay loam, silty clay loam, gravelly clay loam.	CL	A-6, A-7	0-1	0-5	95-100	75-100	70-95	65-80	30-50	15-30
Ava----------	0-6	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	6-32	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-20
	32-42	Silty clay loam, loam, clay loam.	CL, CL-ML, ML	A-4, A-6, A-7	0	0	100	95-100	90-100	80-90	20-45	5-20
	42-60	Loam, silt loam, clay loam.	CL, ML, CL-ML	A-4, A-6	0	0	100	95-100	90-100	80-90	25-40	5-20
934D3:												
Blair--------	0-5	Silt loam-----	CL-ML, CL	A-4, A-6	0	0-2	95-100	90-100	90-100	85-95	20-35	5-15
	5-52	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	90-100	80-100	30-50	15-30
	52-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-95	30-50	15-30
Grantfork----	0-4	Silt loam-----	CL	A-6	0	0	100	95-100	85-95	80-90	25-40	10-20
	4-34	Silty clay loam, clay loam, loam.	CL	A-6, A-7	0	0	100	90-100	80-90	70-80	30-45	10-20
	34-60	Clay loam, loam.	CL	A-6, A-7	0	0-5	95-100	85-95	70-80	55-75	25-45	10-25
941:												
Piasa--------	0-12	Silt loam-----	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	12-39	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	0	100	100	95-100	95-100	40-55	15-25
	39-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-25
Virden-------	0-8	Silt loam-----	CL	A-7, A-6	0	0	100	100	95-100	95-100	30-45	10-20
	8-51	Silty clay, silty clay loam.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	40-55	15-30
	51-60	Silty clay loam, silt loam.	CL	A-7, A-6	0	0	100	100	95-100	90-100	30-45	10-20

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag-ments > 10 inches	Frag-ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas-ticity index
	In				Pct	Pct					Pct	
991:												
Huey----------	0-8	Silt loam-----	CL, CL-ML, ML	A-4, A-6	0	0	100	100	90-100	85-95	20-35	3-15
	8-11	Silt, silt loam.	CL, ML, CL-ML	A-6, A-4	0	0	100	100	90-100	85-95	15-30	3-15
	11-20	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	25-45	10-25
	20-33	Silt loam, silty clay loam, silty clay.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-50	15-30
	33-60	Loam, silt loam, silty clay loam.	CL	A-6	0	0	95-100	90-100	80-95	65-90	20-35	10-20
Cisne---------	0-7	Silt loam-----	CL, CL-ML, ML	A-4	0	0	100	100	90-100	90-100	25-35	5-10
	7-21	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	21-44	Silty clay loam, silty clay.	CH, CL	A-7	0	0	100	100	90-100	90-100	45-60	20-35
	44-60	Silty clay loam, clay loam, silt loam.	CL	A-6, A-7	0	0-5	100	90-100	70-95	50-90	30-50	15-30
993:												
Piasa---------	0-8	Silt loam-----	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	8-11	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	8-20
	11-52	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	0	100	100	95-100	95-100	40-55	15-25
	52-60	Silty clay loam, silt loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-25
Cowden--------	0-9	Silt loam-----	CL-ML, CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	3-15
	9-18	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	90-100	25-35	5-15
	18-42	Silty clay loam, silty clay.	CH, CL	A-7-6	0	0	100	100	95-100	95-100	45-60	20-32
	42-60	Silt loam-----	CL	A-6, A-7-6	0	0	100	100	95-100	95-100	30-45	10-20
995:												
Piasa---------	0-9	Silt loam-----	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	9-14	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	8-20
	14-60	Silty clay, silty clay loam.	CL, ML, MH, CH	A-7	0	0	100	100	95-100	95-100	40-55	15-25
Herrick-------	0-12	Silt loam-----	CL, ML	A-4, A-6	0	0	100	100	95-100	90-100	30-40	5-15
	12-35	Silty clay loam, silty clay.	CH, CL	A-7-6	0	0	100	100	95-100	90-100	45-60	25-40
	35-60	Silty clay loam, silt loam.	CL	A-6, A-7-6	0	0	100	100	95-100	90-100	35-50	20-35
1288----------- Petrolia	0-8	Silty clay loam.	CL	A-6, A-7	0	0	100	95-100	90-100	80-100	30-45	10-20
	8-60	Silty clay loam.	CL	A-6, A-7	0	0	100	95-100	90-100	80-100	35-45	15-25
1334----------- Birds	0-6	Silt loam-----	CL	A-4, A-6	0	0	100	95-100	90-100	80-100	24-34	8-15
	6-60	Silt loam-----	CL	A-4, A-6	0	0	100	95-100	90-100	80-100	24-34	8-15

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 10 inches	Frag- ments 3-10 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct	Pct					Pct	
3084---------- Okaw	0-16	Silty clay loam.	CL	A-7, A-6	0	0	100	100	95-100	90-100	35-50	15-30
	16-60	Silty clay loam, silty clay, clay.	CH, CL	A-7	0	0	100	100	95-100	80-100	45-65	20-40
3108---------- Bonnie	0-6	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	27-34	8-12
	6-26	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	27-34	8-12
	26-60	Silt loam, silty clay loam.	CL	A-4, A-6	0	0	100	100	90-100	80-100	25-39	8-15
3288---------- Petrolia	0-9	Silty clay loam.	CL	A-6, A-7	0	0	100	95-100	90-100	80-100	30-45	10-20
	9-28	Silty clay loam.	CL	A-6, A-7	0	0	100	95-100	90-100	80-100	35-45	15-25
	28-60	Silty clay loam, silt loam.	CL	A-4, A-6, A-7	0	0	100	95-100	80-100	60-100	20-45	8-20
3333---------- Wakeland	0-7	Silt loam-----	ML	A-4	0	0	100	100	90-100	80-90	27-36	4-10
	7-60	Silt loam-----	ML	A-4	0	0	100	100	90-100	80-90	27-36	4-10
3334---------- Birds	0-9	Silt loam-----	CL	A-4, A-6	0	0	100	95-100	90-100	80-100	24-34	8-15
	9-60	Silt loam, silty clay loam.	CL	A-4, A-6	0	0	100	95-100	90-100	80-100	24-34	8-15
3336---------- Wilbur	0-8	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	70-95	20-35	4-15
	8-60	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	80-95	20-35	4-15
	32-60	Silt loam, loam.	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	65-95	20-35	4-15
3382---------- Belknap	0-9	Silt loam-----	ML, CL, CL-ML	A-4	0	0	100	95-100	90-100	80-100	20-30	2-8
	9-60	Silt loam-----	ML, CL-ML, CL	A-4, A-6	0	0	100	95-100	90-100	80-100	20-35	NP-12
3415---------- Orion	0-7	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	80-100	25-35	4-12
	7-21	Stratified silt loam to very fine sand.	CL, CL-ML	A-4	0	0	100	100	90-100	70-80	20-30	4-10
	21-60	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	85-100	85-100	20-40	4-18
3787---------- Banlic	0-8	Silt loam-----	ML, CL, CL-ML	A-4	0	0	100	95-100	90-100	85-95	20-30	3-10
	8-21	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	95-100	90-100	85-95	20-30	3-10
	21-38	Silt loam, silt.	ML, CL-ML, CL	A-4	0	0	100	95-100	90-100	85-95	20-30	3-10
	38-60	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	95-100	90-100	85-95	20-30	3-10
7084---------- Okaw	0-15	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
	15-42	Silty clay, clay, silty clay loam.	CH	A-7	0	0	100	95-100	95-100	85-100	50-70	30-50
	42-60	Silty clay loam, silty clay, clay.	CH, CL	A-7	0	0	100	100	95-100	80-100	45-65	20-40

Table 15.--Engineering Index Properties--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 10 inches	Fragments 3-10 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO			4	10	40	200		
	In				Pct	Pct					Pct	
7122B--------- Colp	0-5	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-20
	5-10	Silty clay loam, silty clay.	CL, CH	A-7, A-6	0	0	100	100	95-100	90-100	35-60	20-40
	10-60	Stratified silty clay loam to silty clay.	CL, CH	A-6, A-7	0	0	100	100	95-100	85-100	35-55	15-30
7337A--------- Creal	0-5	Silt loam-----	ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	30-40	5-15
	5-31	Silt loam-----	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	85-100	25-35	4-12
	31-60	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	0	100	100	95-100	90-100	35-50	10-25
7338A--------- Hurst	0-5	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	95-100	95-100	75-100	20-35	4-15
	5-10	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	90-100	20-35	5-15
	10-32	Silty clay loam, silty clay, clay.	CL, CH	A-7	0	0	100	100	95-100	90-100	40-60	20-35
	32-60	Stratified sandy clay loam to silty clay.	CL, CH	A-6, A-7	0	0	100	100	90-100	85-100	35-55	15-30
8109---------- Racoon	0-9	Silt loam-----	CL	A-4, A-6	0	0	100	100	95-100	90-100	20-40	8-20
	9-34	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-40	5-20
	34-54	Silty clay loam.	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-50	15-30
	54-60	Stratified loamy fine sand to silty clay.	SM, ML, CL, SC	A-4, A-6, A-7	0	0	100	90-100	55-100	45-90	25-45	3-20

Table 16.--Physical and Chemical Properties of the Soils

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
2---------------- Cisne	0-8	15-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.8	Low-----------	0.37	3	6	2-3
	8-17	15-27	1.25-1.45	0.06-0.6	0.18-0.20	4.5-6.0	Low-----------	0.37			
	17-48	35-45	1.40-1.60	<0.06	0.09-0.15	4.5-6.0	High----------	0.37			
	48-60	25-37	1.50-1.70	<0.06	0.08-0.14	5.1-6.5	Moderate------	0.37			
3A, 3B----------- Hoyleton	0-15	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low-----------	0.32	3	6	2-3
	15-46	35-45	1.40-1.65	0.06-0.2	0.13-0.20	4.5-6.0	High----------	0.43			
	46-60	15-33	1.35-1.70	0.06-0.2	0.17-0.22	5.1-7.3	Moderate------	0.43			
4B, 4C2---------- Richview	0-13	20-27	1.20-1.40	0.6-2.0	0.22-0.24	5.1-7.3	Low-----------	0.32	5	6	2-3
	13-42	25-35	1.30-1.50	0.6-2.0	0.18-0.20	4.5-6.5	Moderate------	0.43			
	42-60	22-35	1.50-1.70	0.6-2.0	0.14-0.20	4.5-6.5	Moderate------	0.43			
5C2-------------- Blair	0-6	20-27	1.35-1.55	0.6-2.0	0.15-0.24	5.1-7.3	Low-----------	0.37	5	6	1-2
	6-38	25-35	1.45-1.60	0.2-0.6	0.16-0.21	4.5-6.0	Moderate------	0.37			
	38-60	18-35	1.45-1.60	0.2-0.6	0.16-0.21	5.1-7.8	Moderate------	0.37			
5C3-------------- Blair	0-3	20-27	1.35-1.55	0.6-2.0	0.15-0.24	5.1-7.3	Low-----------	0.37	5	6	1-3
	3-60	18-35	1.45-1.60	0.2-0.6	0.16-0.21	5.1-7.8	Moderate------	0.37			
5D--------------- Blair	0-5	20-27	1.35-1.55	0.6-2.0	0.15-0.24	5.1-7.3	Low-----------	0.37	5	6	1-2
	5-20	25-35	1.45-1.60	0.2-0.6	0.16-0.21	4.5-6.0	Moderate------	0.37			
	20-60	18-35	1.45-1.60	0.2-0.6	0.16-0.21	5.1-7.8	Moderate------	0.37			
5D3-------------- Blair	0-3	20-27	1.35-1.55	0.6-2.0	0.15-0.24	5.1-7.3	Low-----------	0.37	5	6	.5-1
	3-37	25-35	1.45-1.60	0.2-0.6	0.16-0.21	4.5-6.0	Moderate------	0.37			
	37-60	18-35	1.45-1.60	0.2-0.6	0.16-0.21	5.1-7.8	Moderate------	0.37			
7D3-------------- Atlas	0-7	30-40	1.35-1.55	0.06-0.2	0.14-0.19	4.5-7.3	High----------	0.43	2	7	.5-1
	7-37	35-45	1.35-1.55	<0.06	0.07-0.19	4.5-7.3	High----------	0.32			
	37-60	30-45	1.35-1.55	<0.06	0.07-0.19	4.5-7.8	High----------	0.32			
8D2-------------- Hickory	0-6	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low-----------	0.37	5	6	1-2
	6-60	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate------	0.28			
8D3-------------- Hickory	0-5	27-35	1.40-1.65	0.6-2.0	0.17-0.19	4.5-7.3	Moderate------	0.37	4	7	.5-1
	5-41	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate------	0.28			
	41-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low-----------	0.28			
8E--------------- Hickory	0-12	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low-----------	0.37	5	6	1-2
	12-60	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate------	0.28			
8E3-------------- Hickory	0-4	27-35	1.40-1.65	0.6-2.0	0.17-0.19	4.5-7.3	Moderate------	0.37	4	6	.5-1
	4-54	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate------	0.28			
	54-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low-----------	0.28			
8G--------------- Hickory	0-10	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low-----------	0.37	5	6	1-2
	10-60	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate------	0.28			
12--------------- Wynoose	0-8	15-25	1.25-1.45	0.6-2.0	0.22-0.24	4.5-7.8	Low-----------	0.43	3	6	1-2
	8-21	12-18	1.30-1.50	0.06-0.2	0.18-0.20	3.6-7.3	Low-----------	0.43			
	21-54	35-42	1.40-1.60	<0.06	0.09-0.13	3.6-6.0	High----------	0.43			
	54-60	25-37	1.50-1.70	0.06-0.2	0.11-0.15	3.6-6.0	Moderate------	0.43			
13A, 13B--------- Bluford	0-6	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low-----------	0.43	3	6	1-2
	6-13	15-25	1.40-1.60	0.2-0.6	0.18-0.20	3.6-6.0	Low-----------	0.43			
	13-37	35-42	1.45-1.65	0.06-0.6	0.11-0.20	3.6-5.5	High----------	0.43			
	37-60	22-35	1.60-1.70	0.06-0.2	0.11-0.16	3.6-6.0	Moderate------	0.43			
13B2------------- Bluford	0-5	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low-----------	0.43	3	6	1-2
	5-22	35-42	1.45-1.65	0.06-0.6	0.11-0.20	3.6-5.5	High----------	0.43			
	22-60	22-35	1.60-1.70	0.06-0.2	0.11-0.16	3.6-6.0	Moderate------	0.43			

Table 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
14B, 14C2-------- Ava	0-13	20-27	1.40-1.60	0.6-2.0	0.21-0.24	4.5-7.3	Low----------	0.43	4	6	1-2
	13-16	22-33	1.40-1.60	0.6-2.0	0.18-0.21	4.5-5.5	Moderate-----	0.43			
	16-34	24-35	1.50-1.70	0.2-0.6	0.18-0.21	4.5-5.5	Moderate-----	0.43			
	34-54	20-30	1.55-1.80	<0.06	0.09-0.11	4.5-5.5	Low----------	0.43			
	54-60	20-30	1.55-1.75	0.2-0.6	0.05-0.10	4.5-6.0	Low----------	0.43			
14C3------------- Ava	0-4	27-35	1.35-1.55	0.6-2.0	0.15-0.19	4.5-7.3	Moderate-----	0.43	3	7	.5-1
	4-29	24-35	1.50-1.70	0.2-0.6	0.18-0.21	4.5-5.5	Moderate-----	0.43			
	29-51	20-30	1.55-1.80	<0.06	0.09-0.11	4.5-5.5	Low----------	0.43			
	51-60	20-30	1.55-1.75	0.2-0.6	0.05-0.10	4.5-6.0	Low----------	0.43			
16--------------- Rushville	0-10	15-27	1.25-1.45	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	1-2
	10-20	10-22	1.30-1.50	0.06-0.2	0.15-0.20	4.5-7.3	Low----------	0.43			
	20-45	35-45	1.30-1.50	<0.06	0.09-0.20	4.5-6.5	High---------	0.43			
	45-60	18-30	1.40-1.55	0.06-0.2	0.16-0.21	5.6-8.4	Moderate-----	0.43			
46A-------------- Herrick	0-19	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate-----	0.28	5	6	3-4
	19-27	35-42	1.20-1.40	0.2-0.6	0.12-0.17	4.5-6.0	High---------	0.43			
	27-53	25-40	1.20-1.40	0.2-0.6	0.16-0.20	5.6-7.3	Moderate-----	0.43			
	53-60	20-30	1.30-1.50	0.2-0.6	0.16-0.21	5.6-8.4	Moderate-----	0.43			
48--------------- Ebbert	0-12	20-27	1.20-1.40	0.2-0.6	0.22-0.24	5.1-7.3	Low----------	0.32	5	6	2-3
	12-22	18-25	1.30-1.50	0.2-0.6	0.20-0.22	5.1-6.0	Low----------	0.43			
	22-60	24-35	1.35-1.55	0.06-0.2	0.18-0.20	4.5-7.3	Moderate-----	0.43			
50--------------- Virden	0-14	25-27	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate-----	0.28	5	6	4-6
	14-54	35-42	1.20-1.45	0.2-0.6	0.11-0.20	5.6-7.8	High---------	0.28			
	54-60	25-33	1.25-1.55	0.2-0.6	0.18-0.22	6.1-8.4	Moderate-----	0.28			
84--------------- Okaw	0-15	15-27	1.20-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	1-3
	15-42	35-60	1.35-1.60	<0.06	0.09-0.18	4.5-7.3	High---------	0.32			
	42-60	35-55	1.50-1.70	<0.06	0.08-0.20	3.6-8.4	High---------	0.32			
112-------------- Cowden	0-9	17-27	1.30-1.50	0.6-2.0	0.22-0.25	5.6-7.3	Low----------	0.37	3	6	2-3
	9-16	17-27	1.25-1.45	0.06-0.2	0.18-0.20	4.5-6.0	Low----------	0.37			
	16-50	35-42	1.35-1.60	0.06-0.2	0.12-0.20	4.5-7.3	High---------	0.37			
	50-60	20-27	1.50-1.70	0.2-0.6	0.17-0.22	5.6-7.8	Moderate-----	0.37			
113A, 113B------- Oconee	0-9	20-27	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Moderate-----	0.32	3	6	2-3
	9-19	18-27	1.30-1.45	0.06-0.2	0.20-0.22	4.5-7.3	Moderate-----	0.43			
	19-43	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High---------	0.43			
	43-60	17-27	1.40-1.60	0.06-0.2	0.20-0.22	5.6-8.4	Moderate-----	0.43			
120-------------- Huey	0-8	15-27	1.35-1.50	0.2-0.6	0.22-0.24	5.1-7.8	Low----------	0.43	3	6	1-2
	8-14	11-25	1.40-1.55	0.06-0.2	0.20-0.22	5.1-7.8	Low----------	0.43			
	14-22	20-35	1.40-1.60	0.06-0.2	0.10-0.18	5.6-8.4	Moderate-----	0.43			
	22-52	25-35	1.45-1.65	<0.06	0.05-0.08	7.4-9.0	Moderate-----	0.43			
	52-60	18-35	1.55-1.75	0.06-0.2	0.10-0.15	6.6-8.4	Moderate-----	0.43			
127B------------- Harrison	0-16	20-27	1.15-1.30	0.6-2.0	0.22-0.24	6.1-7.3	Low----------	0.32	5	6	2-4
	16-60	25-35	1.25-1.40	0.6-2.0	0.18-0.22	5.1-6.5	Moderate-----	0.43			
164A------------- Stoy	0-12	20-27	1.20-1.40	0.2-0.6	0.22-0.24	4.5-6.5	Low----------	0.43	5	6	1-2
	12-38	27-35	1.35-1.55	0.06-0.2	0.18-0.20	4.5-5.5	Moderate-----	0.43			
	38-53	27-35	1.55-1.75	0.06-0.2	0.09-0.12	4.5-5.5	Moderate-----	0.43			
	53-60	20-27	1.55-1.75	0.06-0.2	0.10-0.15	4.5-6.0	Low----------	0.43			
164B------------- Stoy	0-16	20-27	1.20-1.40	0.2-0.6	0.22-0.24	4.5-6.5	Low----------	0.43	5	6	1-2
	16-37	27-35	1.35-1.55	0.06-0.2	0.18-0.20	4.5-5.5	Moderate-----	0.43			
	37-47	27-35	1.55-1.75	0.06-0.2	0.09-0.12	4.5-5.5	Moderate-----	0.43			
	47-60	20-27	1.55-1.75	0.06-0.2	0.10-0.15	4.5-6.0	Low----------	0.43			
164C2------------ Stoy	0-6	20-27	1.20-1.40	0.2-0.6	0.22-0.24	4.5-6.5	Low----------	0.43	5	6	1-2
	6-31	27-35	1.35-1.55	0.06-0.2	0.18-0.20	4.5-5.5	Moderate-----	0.43			
	31-41	27-35	1.55-1.75	0.06-0.2	0.09-0.12	4.5-5.5	Moderate-----	0.43			
	41-60	20-27	1.55-1.75	0.06-0.2	0.10-0.15	4.5-6.0	Low----------	0.43			
165-------------- Weir	0-5	12-27	1.30-1.50	0.2-0.6	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	1-2
	5-14	12-20	1.40-1.55	0.06-0.2	0.17-0.20	4.5-7.3	Low----------	0.43			
	14-47	35-40	1.40-1.60	<0.06	0.18-0.20	4.5-5.5	High---------	0.43			
	47-60	20-27	1.45-1.65	0.06-0.2	0.20-0.22	4.5-6.5	Low----------	0.43			

Table 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
214B, 214C2------ Hosmer	0-10	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	4	5	1-2
	10-36	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	36-60	16-26	1.60-1.70	<0.06	0.06-0.08	4.5-6.0	Low----------	0.43			
214C3------------ Hosmer	0-3	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	3	5	1-2
	3-29	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	29-60	16-26	1.60-1.70	<0.06	0.06-0.08	4.5-6.0	Low----------	0.43			
214D------------- Hosmer	0-11	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	4	5	1-2
	11-35	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	35-60	16-26	1.60-1.70	<0.06	0.06-0.08	4.5-6.0	Low----------	0.43			
214D3------------ Hosmer	0-4	10-17	1.20-1.40	0.6-2.0	0.22-0.24	4.5-6.5	Low----------	0.43	3	5	1-2
	4-30	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	30-60	16-26	1.60-1.70	<0.06	0.06-0.08	4.5-6.0	Low----------	0.43			
308B2, 308C2----- Alford	0-8	12-26	1.25-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.37	4	5	1-2
	8-60	22-32	1.35-1.50	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.37			
338A------------- Hurst	0-8	20-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	1-2
	8-16	18-30	1.30-1.50	0.2-0.6	0.20-0.22	3.6-6.0	Low----------	0.43			
	16-60	35-48	1.45-1.70	<0.06	0.10-0.17	3.6-7.3	High---------	0.32			
432B------------- Geff	0-8	18-27	1.15-1.35	0.6-2.0	0.22-0.24	5.6-7.3	Low----------	0.37	5	6	1-3
	8-17	18-27	1.35-1.45	0.6-2.0	0.20-0.22	4.5-7.3	Low----------	0.43			
	17-33	24-35	1.35-1.55	0.6-2.0	0.18-0.20	4.5-6.0	Moderate-----	0.43			
	33-60	15-30	1.40-1.75	0.6-2.0	0.15-0.18	4.5-7.3	Low----------	0.32			
453B, 453C2------ Muren	0-12	15-27	1.25-1.40	0.6-2.0	0.22-0.24	5.1-6.5	Low----------	0.37	5	6	.5-2
	12-54	22-30	1.35-1.50	0.6-2.0	0.18-0.20	5.1-6.0	Moderate-----	0.37			
	54-60	8-20	1.30-1.45	0.6-2.0	0.20-0.22	5.6-6.5	Low----------	0.37			
474-------------- Piasa	0-8	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate-----	0.37	3	6	2-4
	8-11	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate-----	0.37			
	11-37	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High---------	0.37			
	37-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate-----	0.37			
517A------------- Marine	0-14	12-18	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.37	3	5	1-2
	14-21	35-48	1.45-1.70	0.06-0.2	0.11-0.18	4.5-6.5	High---------	0.32			
	21-60	15-35	1.45-1.65	0.2-0.6	0.18-0.22	5.1-6.5	Moderate-----	0.43			
533. Urban land											
584C2------------ Grantfork	0-6	20-27	1.35-1.55	0.2-0.6	0.18-0.20	4.5-7.8	Low----------	0.37	5	6	1-2
	6-28	20-30	1.40-1.60	0.2-0.6	0.15-0.20	5.1-9.0	Low----------	0.37			
	28-60	20-30	1.65-1.80	0.06-0.2	0.07-0.10	7.4-9.0	Moderate-----	0.37			
584C3------------ Grantfork	0-4	27-30	1.35-1.55	0.2-0.6	0.15-0.18	4.5-7.8	Low----------	0.37	4	7	.5-1
	4-22	20-30	1.40-1.60	0.2-0.6	0.15-0.20	5.1-9.0	Low----------	0.37			
	22-60	20-30	1.65-1.80	0.06-0.2	0.07-0.10	7.4-9.0	Moderate-----	0.37			
584D2------------ Grantfork	0-7	20-27	1.35-1.55	0.2-0.6	0.18-0.20	4.5-7.8	Low----------	0.37	5	6	1-2
	7-18	20-30	1.40-1.60	0.2-0.6	0.15-0.20	5.1-9.0	Low----------	0.37			
	18-60	20-30	1.65-1.80	0.06-0.2	0.07-0.10	7.4-9.0	Moderate-----	0.37			
621B2------------ Coulterville	0-8	15-27	1.40-1.60	0.2-0.6	0.21-0.24	5.6-7.8	Low----------	0.43	3	6	1-2
	8-24	27-35	1.40-1.60	0.06-0.2	0.14-0.24	4.5-7.8	Moderate-----	0.43			
	24-33	18-35	1.45-1.60	0.06-0.2	0.10-0.15	7.4-8.4	Moderate-----	0.43			
	33-60	15-30	1.40-1.60	0.2-0.6	0.05-0.10	7.4-8.4	Low----------	0.43			
621C3------------ Coulterville	0-4	27-35	1.35-1.55	0.2-0.6	0.14-0.19	5.1-7.8	Moderate-----	0.43	2	7	.5-1
	4-30	27-35	1.40-1.60	0.06-0.2	0.14-0.24	4.5-7.8	Moderate-----	0.43			
	30-38	18-35	1.45-1.60	0.06-0.2	0.10-0.15	7.4-8.4	Moderate-----	0.43			
	38-60	15-30	1.40-1.60	0.2-0.6	0.05-0.10	7.4-8.4	Low----------	0.43			
801B------------- Orthents	0-60	20-35	1.35-1.55	0.2-2.0	0.18-0.22	5.1-7.8	Moderate-----	0.43	5	6	.2-1
821C------------- Morristown	0-5	18-27	1.35-1.50	0.6-2.0	0.15-0.20	6.1-8.4	Low----------	0.43	2	4L	.5-2
	5-60	---	1.65-1.90	0.2-0.6	0.03-0.11	7.4-8.4	Moderate-----	0.32			

Table 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
821G------------- Morristown	0-4	18-27	1.45-1.70	0.6-2.0	0.08-0.16	6.1-8.4	Low-----------	0.32	5	8	<.5
	4-60	20-35	1.65-1.90	0.2-0.6	0.03-0.11	7.4-8.4	Moderate-----	0.32			
850D3:											
Hickory---------	0-8	27-35	1.40-1.65	0.6-2.0	0.17-0.19	4.5-7.3	Moderate-----	0.37	4	7	.5-1
	8-60	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate-----	0.28			
Hosmer----------	0-6	27-30	1.30-1.50	0.6-2.0	0.21-0.23	4.5-6.5	Moderate-----	0.43	3	7	.5-1
	6-34	24-30	1.30-1.50	0.6-2.0	0.18-0.22	4.5-5.5	Moderate-----	0.43			
	34-60	16-26	1.60-1.70	<0.06	0.06-0.08	4.5-6.0	Low-----------	0.43			
880A:											
Darmstadt-------	0-13	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low-----------	0.43	3	6	.5-2
	13-17	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate-----	0.43			
	17-41	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate-----	0.43			
	41-60	15-30	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low-----------	0.43			
Coulterville----	0-7	15-27	1.40-1.60	0.2-0.6	0.21-0.24	5.6-7.8	Low-----------	0.43	3	6	.5-2
	7-12	27-35	1.40-1.60	0.06-0.2	0.14-0.24	4.5-7.8	Moderate-----	0.43			
	12-33	18-35	1.45-1.60	0.06-0.2	0.10-0.15	7.4-8.4	Moderate-----	0.43			
	33-60	15-30	1.40-1.60	0.2-0.6	0.05-0.10	7.4-8.4	Low-----------	0.43			
880B2:											
Darmstadt-------	0-5	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low-----------	0.43	3	6	.5-2
	5-14	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate-----	0.43			
	14-26	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate-----	0.43			
	26-60	15-30	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low-----------	0.43			
Coulterville----	0-6	15-27	1.40-1.60	0.2-0.6	0.21-0.24	5.6-7.8	Low-----------	0.43	3	6	.5-2
	6-32	27-35	1.40-1.60	0.06-0.2	0.14-0.24	4.5-7.8	Moderate-----	0.43			
	32-49	18-35	1.45-1.60	0.06-0.2	0.10-0.15	7.4-8.4	Moderate-----	0.43			
	49-60	15-30	1.40-1.60	0.2-0.6	0.05-0.10	7.4-8.4	Low-----------	0.43			
900E:											
Hickory---------	0-15	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low-----------	0.37	5	6	1-2
	15-22	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate-----	0.28			
	22-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low-----------	0.28			
Wellston--------	0-9	13-27	1.30-1.50	0.6-2.0	0.18-0.22	5.1-6.5	Low-----------	0.37	3	6	1-2
	9-27	18-35	1.30-1.65	0.6-2.0	0.17-0.21	4.5-6.0	Low-----------	0.37			
	27-47	15-30	1.30-1.60	0.6-2.0	0.12-0.17	4.5-6.0	Low-----------	0.37			
	47	---	---	0.0-0.2	---	---	-------------	----			
900G:											
Wellston--------	0-7	13-27	1.30-1.50	0.6-2.0	0.18-0.22	5.1-6.5	Low-----------	0.37	3	6	1-2
	7-11	18-35	1.30-1.65	0.6-2.0	0.17-0.21	4.5-6.0	Low-----------	0.37			
	11-48	15-30	1.30-1.60	0.6-2.0	0.12-0.17	4.5-6.0	Low-----------	0.37			
	48	---	---	0.0-0.2	---	---	-------------	----			
Hickory---------	0-19	19-25	1.30-1.50	0.6-2.0	0.20-0.22	4.5-7.3	Low-----------	0.37	5	6	1-2
	19-50	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-7.3	Moderate-----	0.28			
	50-60	15-32	1.50-1.70	0.6-2.0	0.11-0.19	5.1-8.4	Low-----------	0.28			
909A, 909B:											
Coulterville----	0-14	15-27	1.40-1.60	0.2-0.6	0.21-0.24	5.6-7.8	Low-----------	0.43	3	6	.5-2
	14-31	27-35	1.40-1.60	0.06-0.2	0.14-0.24	4.5-7.8	Moderate-----	0.43			
	31-47	18-35	1.45-1.60	0.06-0.2	0.10-0.15	7.4-8.4	Moderate-----	0.43			
	47-60	15-30	1.40-1.60	0.2-0.6	0.05-0.10	7.4-8.4	Low-----------	0.43			
Oconee----------	0-10	20-27	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Moderate-----	0.32	3	6	2-3
	10-14	18-27	1.30-1.45	0.06-0.2	0.20-0.22	4.5-7.3	Moderate-----	0.43			
	14-32	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High---------	0.43			
	32-48	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate-----	0.43			
	48-60	17-27	1.40-1.60	0.06-0.2	0.20-0.22	5.6-8.4	Moderate-----	0.43			
912A:											
Darmstadt-------	0-18	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low-----------	0.43	3	6	.5-2
	18-32	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate-----	0.43			
	32-36	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate-----	0.43			
	36-60	15-30	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low-----------	0.43			

Table 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
912A:											
Hoyleton--------	0-8	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low-----------	0.32	3	6	2-3
	8-16	15-27	1.35-1.60	0.2-0.6	0.16-0.18	4.5-6.5	Low-----------	0.43			
	16-38	35-45	1.40-1.65	0.06-0.2	0.13-0.20	4.5-6.0	High----------	0.43			
	38-60	15-33	1.35-1.70	0.06-0.2	0.17-0.22	5.1-7.3	Moderate------	0.43			
912B2:											
Darmstadt-------	0-7	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low-----------	0.43	3	6	.5-2
	7-13	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate------	0.43			
	13-18	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate------	0.43			
	18-60	15-30	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low-----------	0.43			
Hoyleton--------	0-7	20-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.3	Low-----------	0.32	3	6	1-3
	7-32	35-45	1.40-1.65	0.06-0.2	0.13-0.20	4.5-6.0	High----------	0.43			
	32-60	15-33	1.35-1.70	0.06-0.2	0.17-0.22	5.1-7.3	Moderate------	0.43			
916A:											
Darmstadt-------	0-12	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low-----------	0.43	3	6	.5-2
	12-19	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate------	0.43			
	19-55	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate------	0.43			
	55-60	15-30	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low-----------	0.43			
Oconee----------	0-8	20-27	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Moderate------	0.32	3	6	2-3
	8-19	18-27	1.30-1.45	0.06-0.2	0.20-0.22	4.5-7.3	Moderate------	0.43			
	19-35	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High----------	0.43			
	35-57	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate------	0.43			
	57-60	17-27	1.40-1.60	0.06-0.2	0.20-0.22	5.6-8.4	Moderate------	0.43			
916B2:											
Darmstadt-------	0-8	10-27	1.30-1.50	0.06-0.2	0.22-0.24	5.1-7.3	Low-----------	0.43	3	6	.5-2
	8-14	27-35	1.40-1.65	0.06-0.2	0.11-0.20	4.5-7.8	Moderate------	0.43			
	14-29	27-35	1.40-1.65	<0.06	0.09-0.10	6.6-9.0	Moderate------	0.43			
	29-60	15-30	1.50-1.70	<0.06	0.10-0.15	7.4-9.0	Low-----------	0.43			
Oconee----------	0-8	20-27	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Moderate------	0.32	3	6	2-3
	8-37	35-42	1.30-1.50	0.06-0.2	0.11-0.17	4.5-6.0	High----------	0.43			
	37-48	20-35	1.40-1.60	0.06-0.2	0.16-0.21	5.1-6.5	Moderate------	0.43			
	48-60	17-27	1.40-1.60	0.06-0.2	0.20-0.22	5.6-8.4	Moderate------	0.43			
920:											
Huey------------	0-8	15-27	1.35-1.50	0.2-0.6	0.22-0.24	5.1-7.8	Low-----------	0.43	3	6	1-2
	8-15	11-25	1.40-1.55	0.06-0.2	0.20-0.22	5.1-7.8	Low-----------	0.43			
	15-60	25-35	1.45-1.65	<0.06	0.05-0.08	7.4-9.0	Moderate------	0.43			
Rushville-------	0-8	15-27	1.25-1.45	0.6-2.0	0.22-0.24	4.5-7.3	Low-----------	0.43	3	6	1-2
	8-16	10-22	1.30-1.50	0.06-0.2	0.15-0.20	4.5-7.3	Low-----------	0.43			
	16-48	35-45	1.30-1.50	<0.06	0.09-0.20	4.5-6.5	High----------	0.43			
	48-57	30-42	1.40-1.60	<0.2	0.11-0.20	4.5-7.8	High----------	0.43			
	57-60	18-30	1.40-1.55	0.06-0.2	0.16-0.21	5.6-8.4	Moderate------	0.43			
929D3:											
Hickory---------	0-8	27-35	1.40-1.65	0.6-2.0	0.17-0.19	4.5-7.3	Moderate------	0.37	4	7	.5-1
	8-60	27-35	1.45-1.65	0.6-2.0	0.15-0.19	4.5-6.0	Moderate------	0.28			
Ava-------------	0-6	27-35	1.35-1.55	0.6-2.0	0.15-0.19	4.5-7.3	Moderate------	0.43	3	7	.5-1
	6-32	24-35	1.50-1.70	0.2-0.6	0.18-0.21	4.5-5.5	Moderate------	0.43			
	32-42	20-30	1.55-1.80	<0.06	0.09-0.11	4.5-5.5	Low-----------	0.43			
	42-60	20-30	1.55-1.75	0.2-0.6	0.05-0.10	4.5-6.0	Low-----------	0.43			
934D3:											
Blair-----------	0-5	20-27	1.35-1.55	0.6-2.0	0.15-0.24	5.1-7.3	Low-----------	0.37	5	6	.5-1
	5-52	25-35	1.45-1.60	0.2-0.6	0.16-0.21	4.5-6.0	Moderate------	0.37			
	52-60	18-35	1.45-1.60	0.2-0.6	0.16-0.21	5.1-7.8	Moderate------	0.37			
Grantfork-------	0-4	20-27	1.35-1.55	0.2-0.6	0.18-0.20	4.5-7.8	Low-----------	0.37	5	6	.5-1
	4-34	20-30	1.40-1.60	0.2-0.6	0.15-0.20	5.1-9.0	Low-----------	0.37			
	34-60	20-30	1.65-1.80	0.06-0.2	0.07-0.10	7.4-9.0	Moderate------	0.37			

Table 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
941:											
Piasa	0-12	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate	0.37	3	6	2-4
	12-39	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High	0.37			
	39-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate	0.37			
Virden	0-8	25-27	1.20-1.40	0.6-2.0	0.21-0.24	5.6-7.8	Moderate	0.28	5	6	4-6
	8-51	35-42	1.20-1.45	0.2-0.6	0.11-0.20	5.6-7.8	High	0.28			
	51-60	25-33	1.25-1.55	0.2-0.6	0.18-0.22	6.1-8.4	Moderate	0.28			
991:											
Huey	0-8	15-27	1.35-1.50	0.2-0.6	0.22-0.24	5.1-7.8	Low	0.43	3	6	1-2
	8-11	11-25	1.40-1.55	0.06-0.2	0.20-0.22	5.1-7.8	Low	0.43			
	11-20	20-35	1.40-1.60	0.06-0.2	0.10-0.18	5.6-8.4	Moderate	0.43			
	20-33	25-35	1.45-1.65	<0.06	0.05-0.08	7.4-9.0	Moderate	0.43			
	33-60	18-35	1.55-1.75	0.06-0.2	0.10-0.15	6.6-8.4	Moderate	0.43			
Cisne	0-7	15-27	1.30-1.50	0.6-2.0	0.22-0.24	4.5-7.8	Low	0.37	3	6	2-3
	7-21	15-27	1.25-1.45	0.06-0.6	0.18-0.20	4.5-6.0	Low	0.37			
	21-44	35-45	1.40-1.60	<0.06	0.09-0.15	4.5-6.0	High	0.37			
	44-60	25-37	1.50-1.70	<0.06	0.08-0.14	5.1-6.5	Moderate	0.37			
993:											
Piasa	0-8	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate	0.37	3	6	2-4
	8-11	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate	0.37			
	11-52	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High	0.37			
	52-60	20-35	1.50-1.70	0.06-0.2	0.10-0.12	7.4-9.0	Moderate	0.37			
Cowden	0-9	17-27	1.30-1.50	0.6-2.0	0.22-0.25	5.6-7.3	Low	0.37	3	6	2-3
	9-18	17-27	1.25-1.45	0.06-0.2	0.18-0.20	4.5-6.0	Low	0.37			
	18-42	35-42	1.35-1.60	0.06-0.2	0.12-0.20	4.5-7.3	High	0.37			
	42-60	20-27	1.50-1.70	0.2-0.6	0.17-0.22	5.6-7.8	Moderate	0.37			
995:											
Piasa	0-9	18-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.8	Moderate	0.37	3	6	2-4
	9-14	18-27	1.30-1.50	0.06-0.2	0.18-0.20	5.6-7.8	Moderate	0.37			
	14-60	35-43	1.35-1.55	<0.06	0.09-0.10	6.1-9.0	High	0.37			
Herrick	0-12	20-27	1.15-1.30	0.6-2.0	0.22-0.24	5.1-7.3	Moderate	0.28	5	6	3-4
	12-35	35-42	1.20-1.40	0.2-0.6	0.12-0.17	4.5-6.0	High	0.43			
	35-60	25-40	1.20-1.40	0.2-0.6	0.16-0.20	5.6-7.3	Moderate	0.43			
1288 Petrolia	0-8	27-35	1.20-1.40	0.2-0.6	0.21-0.23	5.6-8.4	Moderate	0.32	5	7	2-3
	8-60	27-35	1.35-1.45	0.2-0.6	0.18-0.20	6.1-7.3	Moderate	0.32			
1334 Birds	0-6	15-25	1.30-1.50	0.2-0.6	0.21-0.25	5.6-7.8	Low	0.43	5	6	1-3
	6-60	18-27	1.40-1.60	0.2-0.6	0.20-0.22	5.1-7.8	Low	0.43			
3084 Okaw	0-16	27-40	1.20-1.40	0.2-0.6	0.21-0.23	4.5-7.3	Moderate	0.43	2	7	1-3
	16-60	35-60	1.45-1.70	<0.06	0.08-0.18	4.5-7.3	High	0.32			
3108 Bonnie	0-6	18-27	1.30-1.50	0.6-2.0	0.22-0.25	4.5-7.3	Low	0.43	5	6	1-3
	6-26	18-27	1.35-1.55	0.2-0.6	0.21-0.24	4.5-5.5	Low	0.43			
	26-60	18-30	1.35-1.55	0.2-0.6	0.14-0.24	4.5-7.8	Low	0.43			
3288 Petrolia	0-9	27-35	1.20-1.40	0.2-0.6	0.21-0.23	5.6-8.4	Moderate	0.32	5	7	2-3
	9-28	27-35	1.35-1.45	0.2-0.6	0.18-0.20	6.1-7.3	Moderate	0.32			
	28-60	20-35	1.40-1.60	0.2-0.6	0.18-0.20	4.5-7.8	Moderate	0.32			
3333 Wakeland	0-7	10-17	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.37	5	5	1-3
	7-60	10-17	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.8	Low	0.37			
3334 Birds	0-9	15-25	1.30-1.50	0.2-0.6	0.21-0.25	5.6-7.8	Low	0.43	5	6	1-3
	9-60	18-27	1.40-1.60	0.2-0.6	0.20-0.22	5.1-7.8	Low	0.43			
3336 Wilbur	0-8	10-26	1.30-1.50	0.6-2.0	0.22-0.24	5.6-7.3	Low	0.37	5	5	1-3
	8-60	10-26	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.8	Low	0.37			
	32-60	10-26	1.30-1.50	0.6-2.0	0.20-0.22	5.6-7.8	Low	0.37			
3382 Belknap	0-9	8-18	1.35-1.55	0.2-2.0	0.21-0.25	4.5-7.3	Low	0.37	5	5	1-3
	9-60	8-25	1.40-1.60	0.2-2.0	0.21-0.24	4.5-6.0	Low	0.37			

Table 16.--Physical and Chemical Properties of the Soils--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodi-bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
3415------------- Orion	0-7	10-18	1.20-1.30	0.6-2.0	0.22-0.24	5.6-7.8	Low----------	0.37	5	5	1-3
	7-21	10-18	1.20-1.30	0.6-2.0	0.20-0.22	5.6-7.8	Low----------	0.37			
	21-60	10-30	1.25-1.45	0.6-2.0	0.18-0.22	5.6-7.8	Low----------	0.37			
3787------------- Banlic	0-8	10-18	1.40-1.60	0.2-0.6	0.20-0.24	5.1-7.8	Low----------	0.43	4	5	.5-1
	8-21	12-18	1.40-1.60	0.06-0.2	0.20-0.22	4.5-7.3	Low----------	0.43			
	21-38	10-18	1.65-1.90	0.06-0.2	0.10-0.11	4.5-6.0	Low----------	0.43			
	38-60	12-18	1.50-1.70	0.2-0.6	0.05-0.08	4.5-6.5	Low----------	0.43			
7084------------- Okaw	0-15	15-27	1.20-1.40	0.6-2.0	0.22-0.24	4.5-7.3	Low----------	0.43	3	6	1-3
	15-42	40-60	1.35-1.60	<0.06	0.09-0.18	4.5-6.0	High---------	0.32			
	42-60	35-60	1.45-1.70	<0.06	0.08-0.18	4.5-7.3	High---------	0.32			
7122B------------ Colp	0-5	27-35	1.35-1.55	0.2-0.6	0.14-0.19	5.1-7.8	Moderate-----	0.43	2	7	.5-1
	5-10	35-50	1.45-1.70	0.06-0.2	0.10-0.17	4.5-5.0	High---------	0.32			
	10-60	30-45	1.50-1.70	0.06-0.2	0.10-0.18	4.5-8.4	High---------	0.32			
7337A------------ Creal	0-5	20-27	1.30-1.50	0.2-0.6	0.22-0.24	5.6-7.3	Low----------	0.37	5	6	1-3
	5-31	18-25	1.35-1.60	0.2-0.6	0.18-0.20	3.6-7.3	Low----------	0.37			
	31-60	25-35	1.35-1.60	0.2-0.6	0.18-0.20	4.5-6.5	Moderate-----	0.37			
7338A------------ Hurst	0-5	20-27	1.25-1.45	0.2-0.6	0.22-0.24	5.1-7.3	Low----------	0.43	3	6	1-2
	5-10	18-30	1.30-1.50	0.2-0.6	0.20-0.22	3.6-6.0	Low----------	0.43			
	10-32	35-48	1.45-1.70	<0.06	0.10-0.17	3.6-7.3	High---------	0.32			
	32-60	20-45	1.50-1.70	<0.06	0.10-0.18	4.5-7.8	High---------	0.32			
8109------------- Racoon	0-9	20-27	1.30-1.50	0.2-0.6	0.22-0.24	4.5-7.3	Moderate-----	0.37	3	6	1-2
	9-34	18-25	1.35-1.50	0.2-0.6	0.20-0.22	4.5-7.3	Moderate-----	0.37			
	34-54	27-35	1.35-1.60	0.06-0.2	0.18-0.20	4.5-5.5	High---------	0.37			
	54-60	18-30	1.40-1.65	0.2-0.6	0.09-0.17	5.6-7.3	Moderate-----	0.37			

Table 17.--Soil and Water Features

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the
< means less than; > means more than. Absence of an entry indicates that the feature is not a concern or t
estimated)

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		U
					Ft			In			
2----------------- Cisne	D	None--------	---	---	0-2.0	Perched	Feb-Jun	>60	---	High-----	H
3A, 3B------------ Hoyleton	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	H
4B, 4C2----------- Richview	C	None--------	---	---	4.0-6.0	Apparent	Feb-May	>60	---	High-----	M
5C2, 5C3, 5D, 5D3- Blair	C	None--------	---	---	1.5-3.5	Apparent	Mar-Jun	>60	---	High-----	H
7D3--------------- Atlas	D	None--------	---	---	1.0-2.0	Perched	Apr-Jun	>60	---	High-----	H
8D2, 8D3, 8E, 8E3, 8G--------------- Hickory	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	M
12---------------- Wynoose	D	None--------	---	---	0-2.0	Perched	Mar-Jun	>60	---	High-----	H
13A, 13B, 13B2---- Bluford	C	None--------	---	---	1.0-3.0	Perched	Mar-Jun	>60	---	High-----	H
14B, 14C2, 14C3--- Ava	C	None--------	---	---	1.5-3.5	Perched	Mar-Jun	>60	---	High-----	M
16---------------- Rushville	D	None--------	---	---	+1-1.0	Perched	Mar-Jun	>60	---	High-----	H
46A--------------- Herrick	B	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	H
48---------------- Ebbert	C/D	None--------	---	---	+1-2.0	Apparent	Mar-Jun	>60	---	High-----	H
50---------------- Virden	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	H
84---------------- Okaw	D	None--------	---	---	+.5-1.0	Apparent	Mar-Jun	>60	---	High-----	H
112--------------- Cowden	D	None--------	---	---	0-2.0	Apparent	Mar-Jun	>60	---	High-----	H
113A, 113B-------- Oconee	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	H

Table 17.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	Ri
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Unc s
					Ft			In			
120-------------- Huey	D	None--------	---	---	+.5-2.0	Perched	Mar-Jun	>60	---	High-----	Hig
127B------------- Harrison	B	None--------	---	---	4.0-6.0	Perched	Feb-May	>60	---	High-----	Hig
164A, 164B, 164C2- Stoy	C	None--------	---	---	1.0-3.0	Perched	Feb-Apr	>60	---	High-----	Hig
165-------------- Weir	D	None--------	---	---	+.5-2.0	Perched	Feb-Jun	>60	---	High-----	Hig
214B, 214C2, 214C3, 214D, 214D3----------- Hosmer	C	None--------	---	---	1.5-3.0	Perched	Mar-Apr	>60	---	High-----	Mod
308B2, 308C2------ Alford	B	None--------	---	---	>6.0	---	---	>60	---	High-----	Mod
338A------ ------- Hurst	D	None--------	---	---	1.0-3.0	Apparent	Feb-Apr	>60	---	Moderate	Hig
432B------------- Geff	C	None--------	---	---	1.0-3.0	Apparent	Feb-Jun	>60	---	High-----	Hig
453B, 453C2------- Muren	B	None--------	---	---	2.0-6.0	Apparent	Mar-Apr	>60	---	High-----	Hig
474-------------- Piasa	D	None--------	---	---	+.5-2.0	Perched	Feb-May	>60	---	High-----	Hig
517A------------- Marine	C	None--------	---	---	1.0-2.0	Perched	Jan-May	>60	---	High-----	Hig
533. Urban land											
584C2, 584C3, 584D2----------- Grantfork	D	None--------	---	---	1.0-3.0	Perched	Jan-May	>60	---	High-----	Hig
621B2, 621C3-- --- Coulterville	D	None--------	---	---	1.0-3.0	Perched	Feb-Jun	>60	---	High-----	Hig
801B------------- Orthents	B	None--------	---	---	>3.0	Perched	Jan-Jun	>60	---	High-----	Hig
821C, 821G-------- Morristown	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	Mod

Table 17.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	U
					Ft			In			
850D3:											
Hickory----------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	M
Hosmer-----------	C	None--------	---	---	2.5-3.0	Perched	Mar-Apr	>60	---	High-----	M
880A, 880B2:											
Darmstadt--------	D	None--------	---	---	1.0-3.0	Perched	Feb-May	>60	---	High-----	H
Coulterville-----	D	None--------	---	---	1.0-3.0	Perched	Feb-Jun	>60	---	High-----	H
900E:											
Hickory----------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	M
Wellston---------	B	None--------	---	---	>6.0	---	---	>40	Soft	High-----	M
900G:											
Wellston---------	B	None--------	---	---	>6.0	---	---	>40	Soft	High-----	M
Hickory----------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	M
909A, 909B:											
Coulterville-----	D	None--------	---	---	1.0-3.0	Perched	Feb-Jun	>60	---	High-----	H
Oconee-----------	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	H
912A, 912B2:											
Darmstadt--------	D	None--------	---	---	1.0-3.0	Perched	Feb-Jun	>60	---	High-----	H
Hoyleton---------	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	H
916A, 916B2:											
Darmstadt--------	D	None--------	---	---	1.0-3.0	Perched	Feb-Jun	>60	---	High-----	H
Oconee-----------	C	None--------	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High-----	H
920:											
Huey-------------	D	None--------	---	---	+.5-2.0	Perched	Mar-Jun	>60	---	High-----	H
Rushville--------	D	None--------	---	---	+1-1.0	Perched	Mar-Jun	>60	---	High-----	H
929D3:											
Hickory----------	C	None--------	---	---	>6.0	---	---	>60	---	Moderate	M
Ava--------------	C	None--------	---	---	1.5-3.5	Perched	Mar-Jun	>60	---	High-----	M
934D3:											
Blair------------	C	None--------	---	---	1.5-3.5	Apparent	Mar-Jun	>60	---	High-----	H
Grantfork--------	D	None--------	---	---	1.0-3.0	Perched	Jan-May	>60	---	High-----	H
941:											
Piasa------------	D	None--------	---	---	+.5-2.0	Perched	Feb-Jun	>60	---	High-----	H
Virden-----------	B/D	None--------	---	---	+.5-2.0	Apparent	Mar-Jun	>60	---	High-----	H

Table 17.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Bedrock: Depth	Bedrock: Hardness	Potential frost action	Ri... Unc... s
					Ft			In			
991:											
Huey	D	None	---	---	+.5-2.0	Perched	Mar-Jun	>60	---	High	Hig
Cisne	D	None	---	---	0-2.0	Perched	Feb-Jun	>60	---	High	Hig
993:											
Piasa	D	None	---	---	+.5-2.0	Perched	Feb-Jun	>60	---	High	Hig
Cowden	D	None	---	---	0-2.0	Apparent	Mar-Jun	>60	---	High	Hig
995:											
Piasa	D	None	---	---	+.5-2.0	Perched	Feb-Jun	>60	---	High	Hig
Herrick	B	None	---	---	1.0-3.0	Apparent	Mar-Jun	>60	---	High	Hig
1288 Petrolia	C/D	Frequent	Brief	Mar-Jun	+.5-3.0	Apparent	Feb-Jun	>60	---	High	Hig
1334 Birds	C/D	Frequent	Brief or long.	Mar-Jun	+.5-1.0	Apparent	Mar-Jun	>60	---	High	Hig
3084 Okaw	D	Frequent	Brief	Mar-Jun	+.5-1.0	Apparent	Mar-Jun	>60	---	High	Hig
3108 Bonnie	C/D	Frequent	Brief or long.	Jan-Jun	+.5-1.0	Apparent	Jan-Jun	>60	---	High	Hig
3288 Petrolia	C/D	Frequent	Brief to very long.	Mar-Jun	+.5-3.0	Apparent	Apr-Jun	>60	---	High	Hig
3333 Wakeland	C	Frequent	Brief or long.	Jan-May	1.0-3.0	Apparent	Jan-Apr	>60	---	High	Hig
3334 Birds	C/D	Frequent	Brief or long.	Mar-Jun	+.5-1.0	Apparent	Mar-Jun	>60	---	High	Hig
3336 Wilbur	B	Frequent	Brief	Oct-Jun	1.5-3.0	Apparent	Mar-Apr	>60	---	High	Mod
3382 Belknap	C	Frequent	Brief or long.	Jan-Jun	1.0-3.0	Apparent	Jan-Jun	>60	---	High	Hig
3415 Orion	C	Frequent	Very brief or brief.	Mar-Nov	1.0-3.0	Apparent	Nov-May	>60	---	High	Hig
3787 Banlic	C	Frequent	Brief	Feb-Apr	1.0-3.0	Perched	Jan-Jun	>60	---	High	Hig
7084 Okaw	D	Rare	---	---	+.5-1.0	Apparent	Mar-Jun	>60	---	High	Hig
7122B Colp	C	Rare	---	---	2.0-4.0	Apparent	Mar-Jun	>60	---	High	Hig

Table 17.--Soil and Water Features--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Potential frost action	R
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness		Un
					Ft			In			
7337A------------- Creal	C	Rare--------	---	---	1.0-3.0	Apparent	Feb-May	>60	---	High-----	Hi
7338A------------- Hurst	D	Rare--------	---	---	1.0-3.0	Apparent	Feb-Apr	>60	---	Moderate	Hi
8109-------------- Racoon	C/D	Occasional	Brief-----	Feb-May	+.5-1.0	Apparent	Feb-Jun	>60	---	High-----	Hi

Table 18.--Classification of the Soils

(An asterisk in the first column indicates that the soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series)

Soil name	Family or higher taxonomic class
Alford	Fine-silty, mixed, mesic Typic Hapludalfs
Atlas	Fine, montmorillonitic, mesic, sloping Aeric Ochraqualfs
*Ava	Fine-silty, mixed, mesic Typic Fragiudalfs
Banlic	Coarse-silty, mixed, nonacid, mesic Aeric Haplaquepts
Belknap	Coarse-silty, mixed, acid, mesic Aeric Fluvaquents
Birds	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Blair	Fine-silty, mixed, mesic Aquic Hapludalfs
Bluford	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Bonnie	Fine-silty, mixed, acid, mesic Typic Fluvaquents
Cisne	Fine, montmorillonitic, mesic Mollic Albaqualfs
Colp	Fine, montmorillonitic, mesic Aquic Hapludalfs
Coulterville	Fine-silty, mixed, mesic Aeric Ochraqualfs
Cowden	Fine, montmorillonitic, mesic Mollic Albaqualfs
Creal	Fine-silty, mixed, mesic Aeric Ochraqualfs
Darmstadt	Fine-silty, mixed, mesic Albic Natraqualfs
Ebbert	Fine-silty, mixed, mesic Argiaquic Argialbolls
Geff	Fine-silty, mixed, mesic Aquic Hapludalfs
Grantfork	Fine-loamy, mixed, mesic, sloping Aeric Ochraqualfs
Harrison	Fine-silty, mixed, mesic Typic Argiudolls
Herrick	Fine, montmorillonitic, mesic Aquic Argiudolls
Hickory	Fine-loamy, mixed, mesic Typic Hapludalfs
*Hosmer	Fine-silty, mixed, mesic Typic Fragiudalfs
Hoyleton	Fine, montmorillonitic, mesic Aquollic Hapludalfs
*Huey	Fine-silty, mixed, mesic Typic.Natraqualfs
Hurst	Fine, montmorillonitic, mesic Aeric Ochraqualfs
Marine	Fine, montmorillonitic, mesic Aeric Albaqualfs
Morristown	Loamy-skeletal, mixed (calcareous), mesic Typic Udorthents
Muren	Fine-silty, mixed, mesic Aquic Hapludalfs
Oconee	Fine, montmorillonitic, mesic Udollic Ochraqualfs
Okaw	Fine, montmorillonitic, mesic Typic Albaqualfs
Orion	Coarse-silty, mixed, nonacid, mesic Aquic Udifluvents
Orthents	Fine-silty, mixed, nonacid, mesic Aquic Udorthents
Petrolia	Fine-silty, mixed, nonacid, mesic Typic Fluvaquents
Piasa	Fine, montmorillonitic, mesic Mollic Natraqualfs
Racoon	Fine-silty, mixed, mesic Typic Ochraqualfs
Richview	Fine-silty, mixed, mesic Mollic Hapludalfs
Rushville	Fine, montmorillonitic, mesic Typic Albaqualfs
Stoy	Fine-silty, mixed, mesic Aquic Hapludalfs
Virden	Fine, montmorillonitic, mesic Typic Argiaquolls
Wakeland	Coarse-silty, mixed, nonacid, mesic Aeric Fluvaquents
Weir	Fine, montmorillonitic, mesic Typic Ochraqualfs
*Wellston	Fine-silty, mixed, mesic Ultic Hapludalfs
Wilbur	Coarse-silty, mixed, mesic Aquic Udifluvents
Wynoose	Fine, montmorillonitic, mesic Typic Albaqualfs

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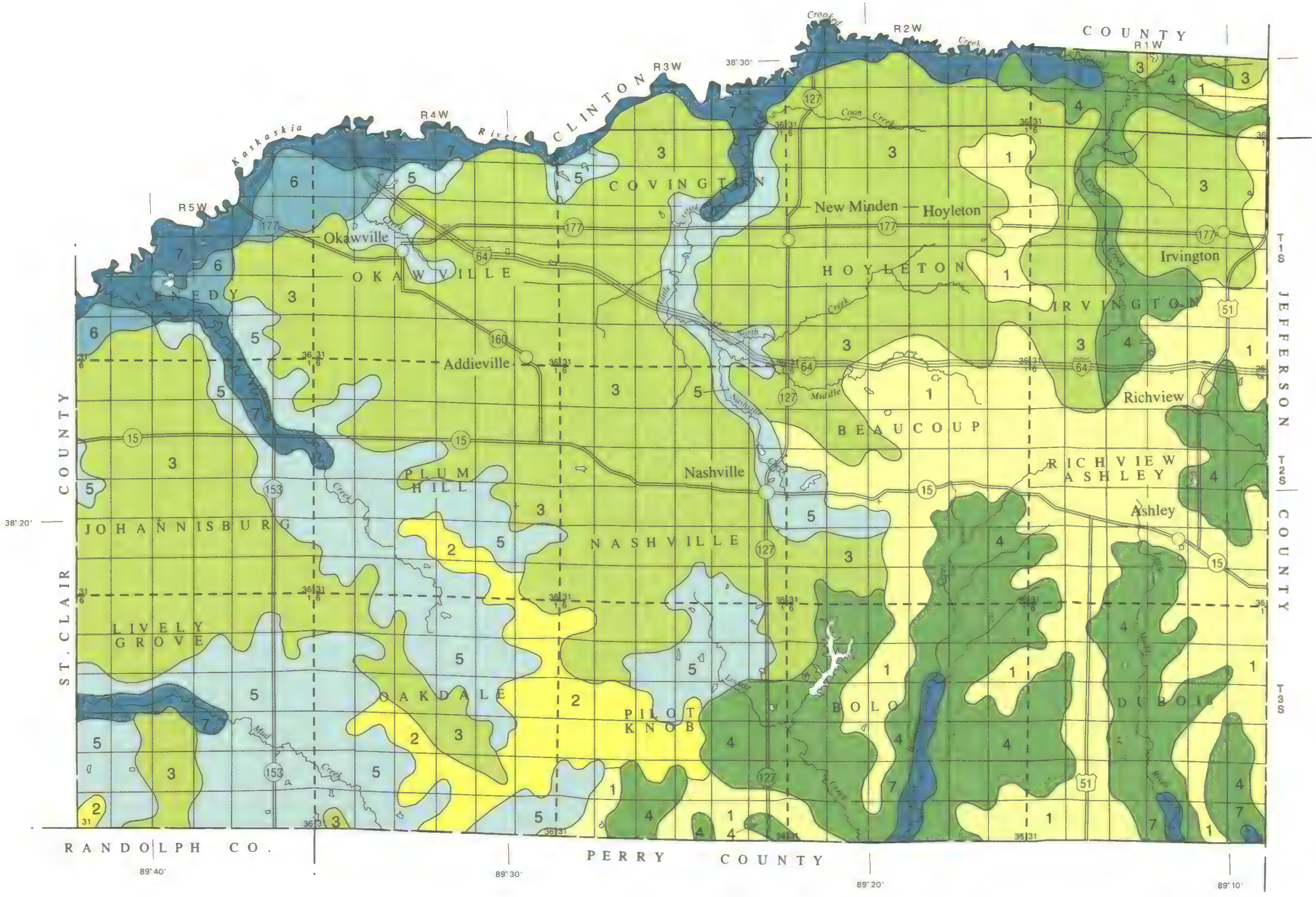


SOIL LEGEND*

1	Bluford-Hoyleton-Wynoose association
2	Marine-Rushville-Muren association
3	Oconee-Darmstadt-Coulterville association
4	Bluford-Hickory-Blair association
5	Muren-Blair-Hickory association
6	Hurst-Okaw association
7	Birds-Wakeland association

*The units on this legend are described in the text under the heading "General Soil Map Units."

Compiled 1998

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
IN COOPERATION WITH
ILLINOIS AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

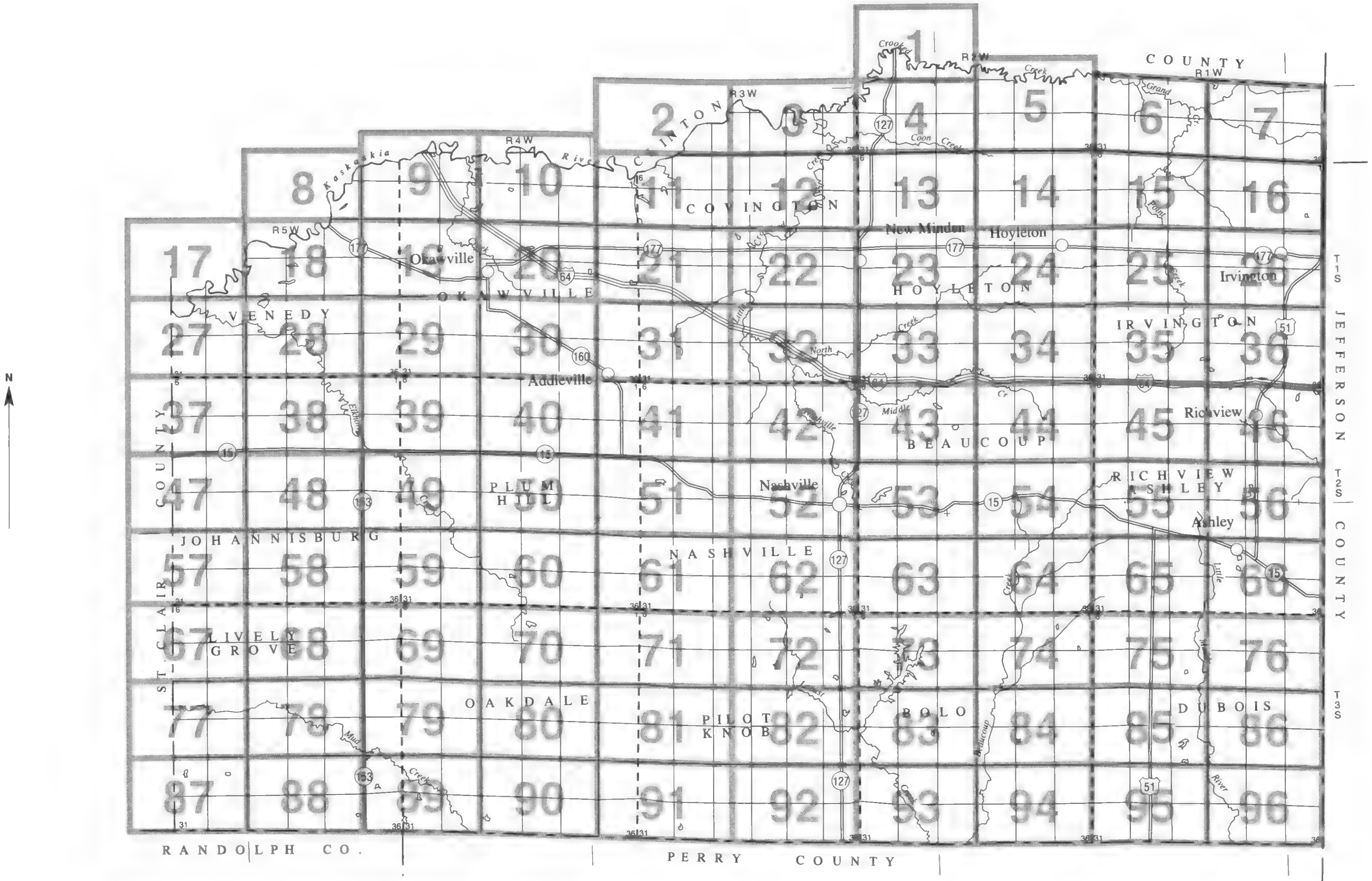
WASHINGTON COUNTY, ILLINOIS

Scale 1:190080

1 0 1 2 3
MILES

1 0 1 2 3 4 5 6
KILOMETERS

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

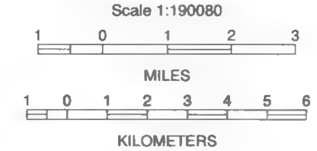


SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

INDEX TO MAP SHEETS
WASHINGTON COUNTY, ILLINOIS

Scale 1:190080



SOIL LEGEND

Map symbols consist of numbers, or a combination of numbers and letters. The initial numbers represent the kind of soil. A capital letter following those numbers indicates the class of slope. Symbols without a slope letter are for nearly level soils that do not have the potential to occur as any other phase that is more sloping. A final number of 2 following the slope letter indicates that the soil is moderately eroded, and 3 indicates that it is severely eroded

SYMBOL	NAME
2	Cisne silt loam
3A	Hoyleton silt loam, 0 to 2 percent slopes
3B	Hoyleton silt loam, 2 to 5 percent slopes
4B	Richview silt loam, 2 to 5 percent slopes
4C2	Richview silt loam, 5 to 10 percent slopes, eroded
5C2	Blair silt loam, 5 to 10 percent slopes, eroded
5C3	Blair silt loam, 5 to 10 percent slopes, severely eroded
5D	Blair silt loam, 10 to 15 percent slopes
5D3	Blair silt loam, 10 to 15 percent slopes, severely eroded
7D3	Atlas silty clay loam, 10 to 15 percent slopes, severely eroded
8D2	Hickory silt loam, 10 to 15 percent slopes, eroded
8D3	Hickory silty clay loam, 10 to 15 percent slopes, severely eroded
8E	Hickory silt loam, 15 to 30 percent slopes
8E3	Hickory clay loam, 15 to 30 percent slopes, severely eroded
8G	Hickory silt loam, 30 to 60 percent slopes
12	Wynoose silt loam
13A	Bluford silt loam, 0 to 2 percent slopes
13B	Bluford silt loam, 2 to 5 percent slopes
13B2	Bluford silt loam, 2 to 5 percent slopes, eroded
14B	Ava silt loam, 2 to 5 percent slopes
14C2	Ava silt loam, 5 to 10 percent slopes, eroded
14C3	Ava silty clay loam, 5 to 10 percent slopes, severely eroded
16	Rushville silt loam
46A	Herrick silt loam, 0 to 2 percent slopes
48	Ebbert silt loam
50	Virden silt loam
84	Okaw silt loam
112	Cowden silt loam
113A	Oconee silt loam, 0 to 2 percent slopes
113B	Oconee silt loam, 2 to 5 percent slopes
120	Huey silt loam
127B	Harrison silt loam, 2 to 5 percent slopes
164A	Stoy silt loam, 0 to 2 percent slopes
164B	Stoy silt loam, 2 to 5 percent slopes
164C2	Stoy silt loam, 5 to 10 percent slopes, eroded
165	Weir silt loam
214B	Hosmer silt loam, 2 to 5 percent slopes
214C2	Hosmer silt loam, 5 to 10 percent slopes, eroded
214C3	Hosmer silt loam, 5 to 10 percent slopes, severely eroded
214D	Hosmer silt loam, 10 to 18 percent slopes
214D3	Hosmer silt loam, 10 to 18 percent slopes, severely eroded
308B2	Alford silt loam, 2 to 5 percent slopes, eroded
308C2	Alford silt loam, 5 to 10 percent slopes, eroded
338A	Hurst silt loam, 0 to 2 percent slopes
432B	Geff silt loam, 2 to 5 percent slopes
453B	Muren silt loam, 2 to 5 percent slopes
453C2	Muren silt loam, 5 to 10 percent slopes, eroded
474	Piasa silt loam
517A	Marine silt loam, 0 to 2 percent slopes
533	Urban land
584C2	Grantfork silt loam, 5 to 10 percent slopes, eroded
584C3	Grantfork silty clay loam, 5 to 10 percent slopes, severely eroded
584D2	Grantfork silt loam, 10 to 15 percent slopes, eroded
621B2	Coulterville silt loam, 2 to 5 percent slopes, eroded
621C3	Coulterville silty clay loam, 5 to 10 percent slopes, severely eroded
801B	Orthents, silty, undulating
821C	Morristown silt loam, 3 to 12 percent slopes
821G	Morristown channery silt loam, 12 to 60 percent slopes
850D3	Hickory-Hosmer complex, 10 to 18 percent slopes, severely eroded
880A	Darmstadt-Coulterville complex, 0 to 2 percent slopes
880B2	Darmstadt-Coulterville complex, 2 to 5 percent slopes, eroded
900E	Hickory-Wellston complex, 18 to 30 percent slopes
900G	Wellston-Hickory complex, 30 to 60 percent slopes
909A	Coulterville-Oconee complex, 0 to 2 percent slopes
909B	Coulterville-Oconee complex, 2 to 5 percent slopes
912A	Darmstadt-Hoyleton complex, 0 to 2 percent slopes
912B2	Darmstadt-Hoyleton complex, 2 to 5 percent slopes, eroded
916A	Darmstadt-Oconee complex, 0 to 2 percent slopes
916B2	Darmstadt-Oconee complex, 2 to 5 percent slopes, eroded
920	Huey-Rushville complex
929D3	Hickory-Ava complex, 10 to 18 percent slopes, severely eroded
934D3	Blair-Grantfork complex, 7 to 15 percent slopes, severely eroded
941	Piasa-Virden complex
991	Huey-Cisne complex
993	Piasa-Cowden complex
995	Piasa-Herrick complex
1288	Petrolia silty clay loam, wet
1334	Birds silt loam, wet
3084	Okaw silty clay loam, frequently flooded
3108	Bonnie silt loam, frequently flooded
3288	Petrolia silty clay loam, frequently flooded
3333	Wakeland silt loam, frequently flooded
3334	Birds silt loam, frequently flooded
3336	Wilbur silt loam, frequently flooded
3382	Belknap silt loam, frequently flooded
3415	Orion silt loam, frequently flooded
3787	Banlic silt loam, frequently flooded
7084	Okaw silt loam, rarely flooded
7122B	Colp silty clay loam, 2 to 5 percent slopes, eroded, rarely flooded
7337A	Creal silt loam, 0 to 2 percent slopes, rarely flooded
7338A	Hurst silt loam, 0 to 2 percent slopes, rarely flooded
8109	Racoon silt loam, occasionally flooded

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

County

Reservation (national forest or park, state forest or park, and large airport)

Field sheet matchline and neatline

AD HOC BOUNDARY (label)

Small airport, airfield, park, oilfield, cemetery, or flood pool

STATE COORDINATE TICK
1 890 000 FEET

LAND DIVISION CORNER (sections and land grants)

ROAD EMBLEMS & DESIGNATIONS

Interstate — 173

Federal — 287

State — 52

RAILROAD (label only as R.R.)

LEVEES

Without road

DAMS

Large (to scale)

Medium or Small (Named where applicable)

PITS

Mine or quarry

WATER FEATURES

DRAINAGE

Perennial, double line

Perennial, single line

Intermittent

Drainage end

Canals or ditches

Drainage and/or irrigation

LAKES, PONDS, AND RESERVOIRS

Perennial

MISCELLANEOUS WATER FEATURES

Marsh or swamp

Wet spot

All miscellaneous water features typically range from 1/4 acre to less than 2 acres in size.

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS — 50 916A

ESCARPMENTS

Bedrock (points down slope)

Other than bedrock (points down slope)

SHORT STEEP SLOPE

SOIL SAMPLE (normally not shown)

MISCELLANEOUS

Clay spot

Gumbo, slick or scabby spot (sodic)

Dumps and other similar nonsoil areas

Rock outcrop (includes sandstone and shale)

Severely eroded spot

Oil waste land

Disturbed soil spot

Glacial till spot

All miscellaneous special symbols represent areas that typically range from 1/4 acre to 2 acres in size

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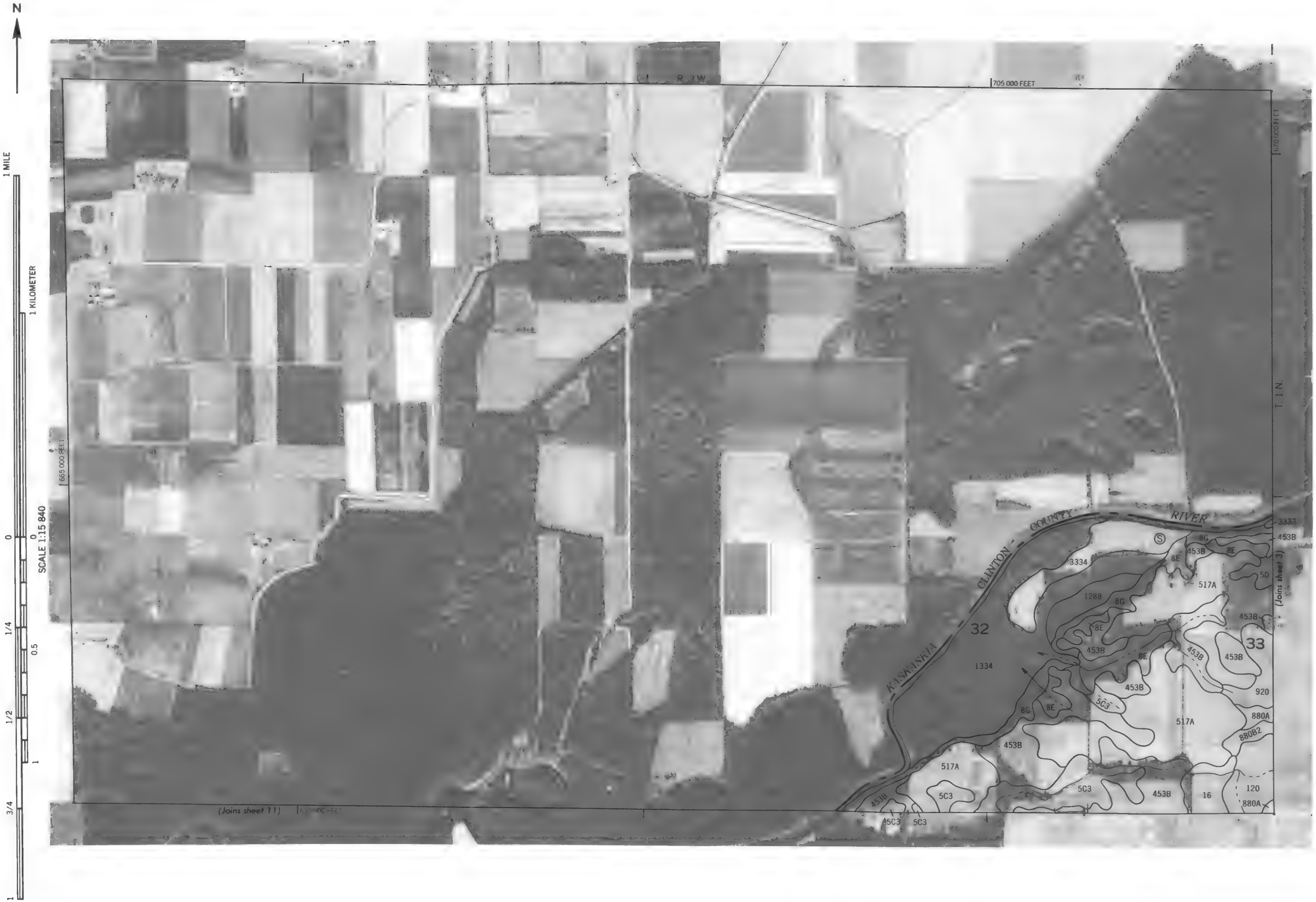

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3

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SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 4

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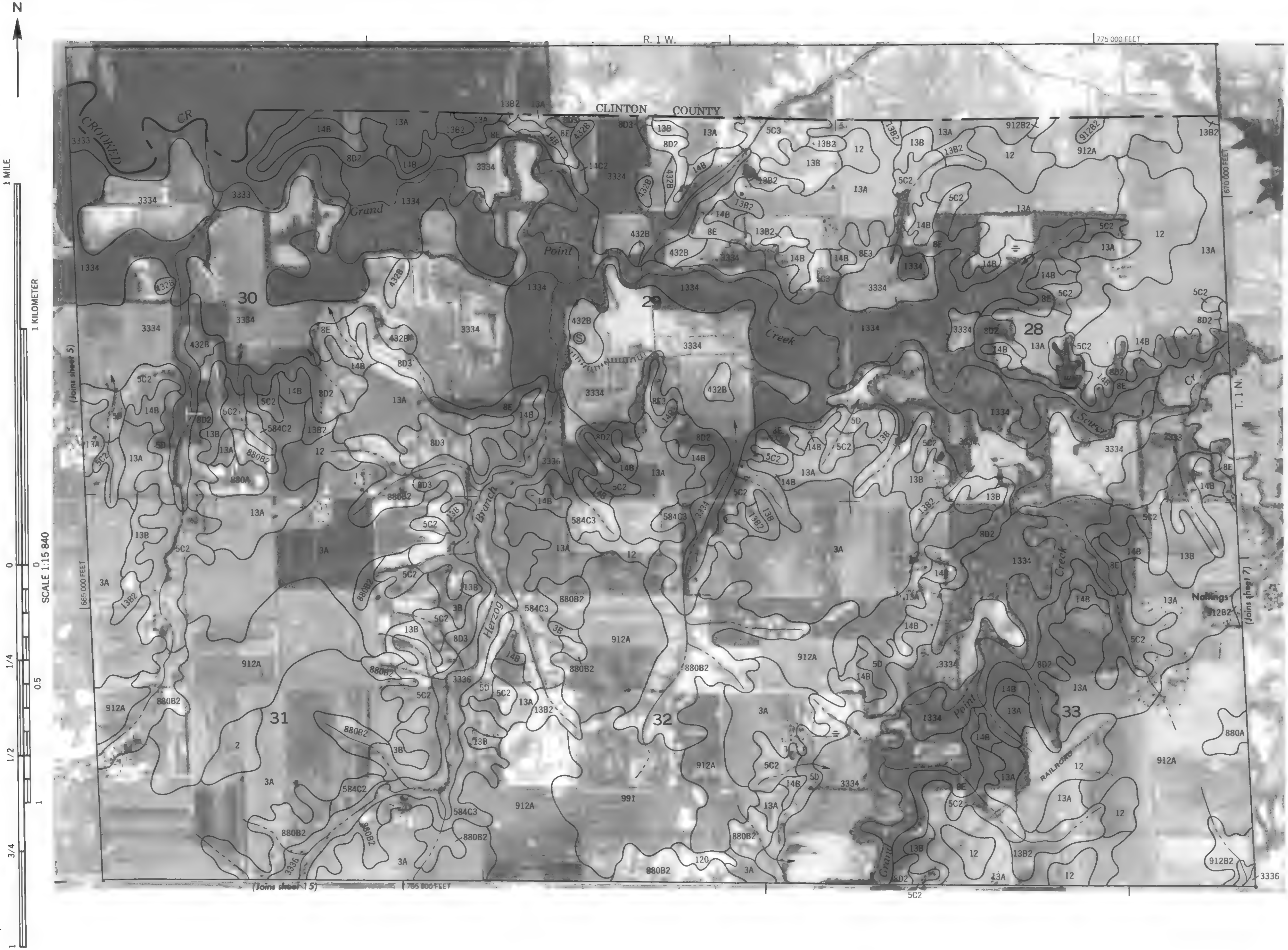
SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 6



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SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 10

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SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 11

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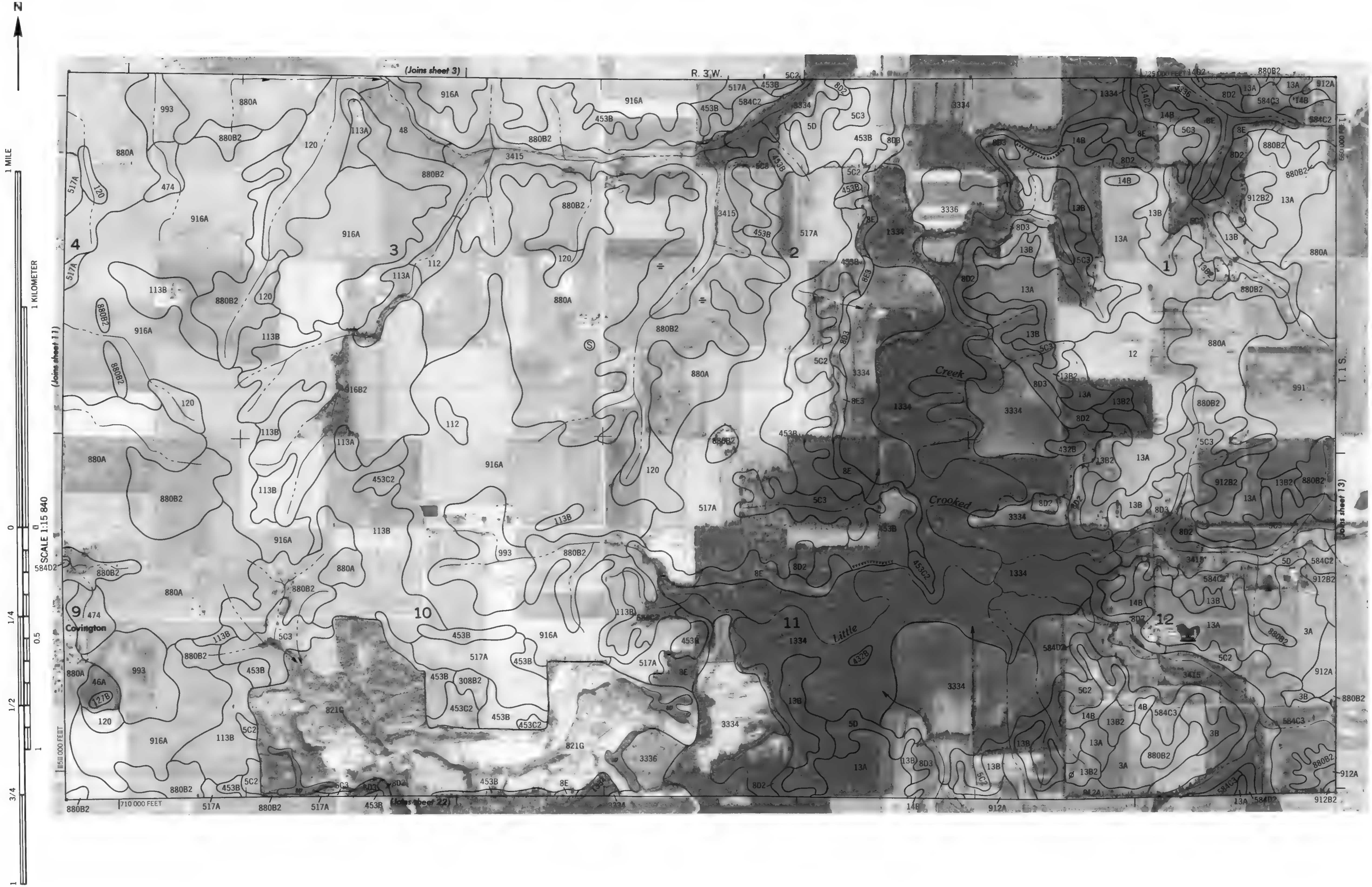

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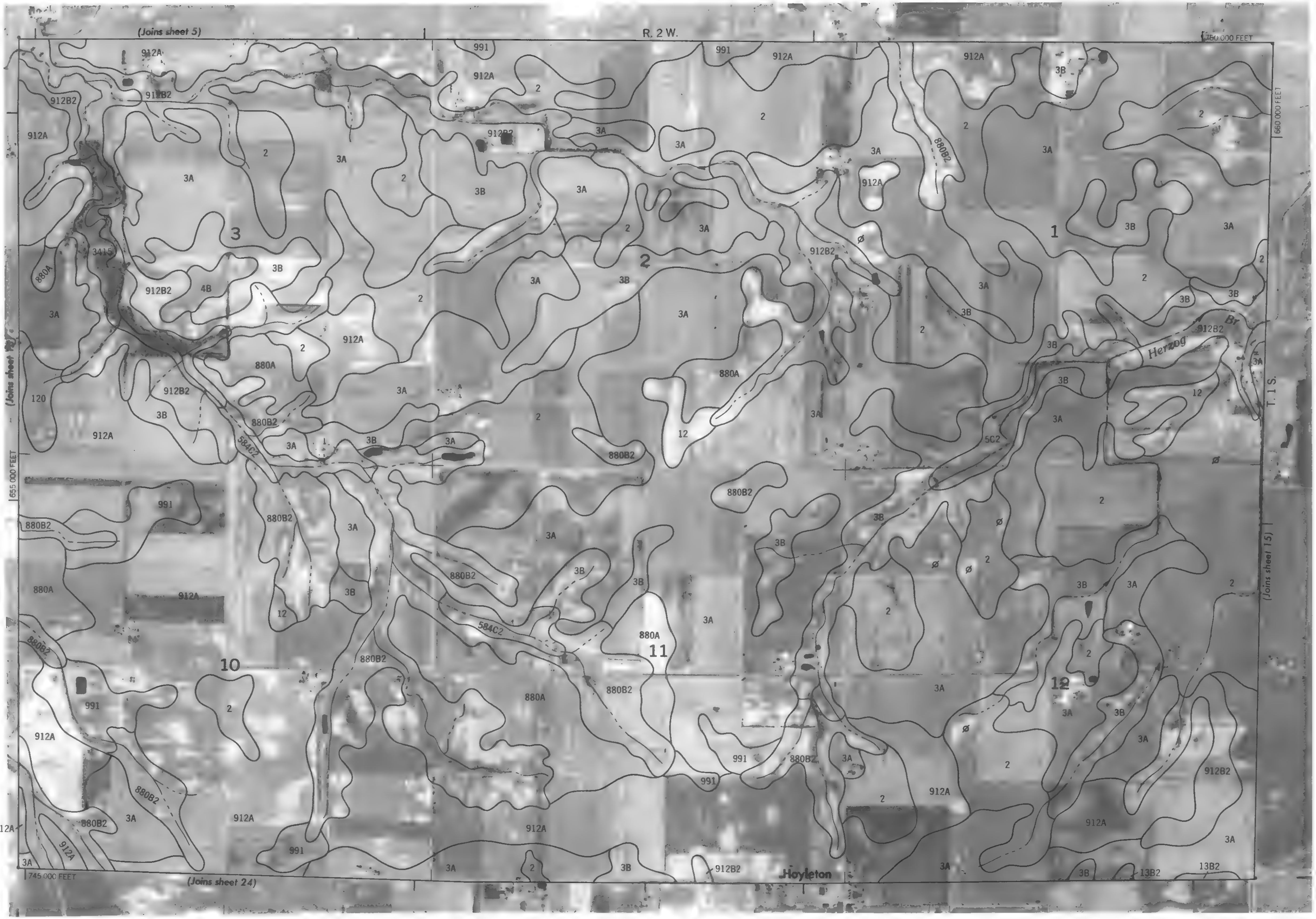
(14)

N

1 MILE

1 KILOMETER

SCALE 1:15 840



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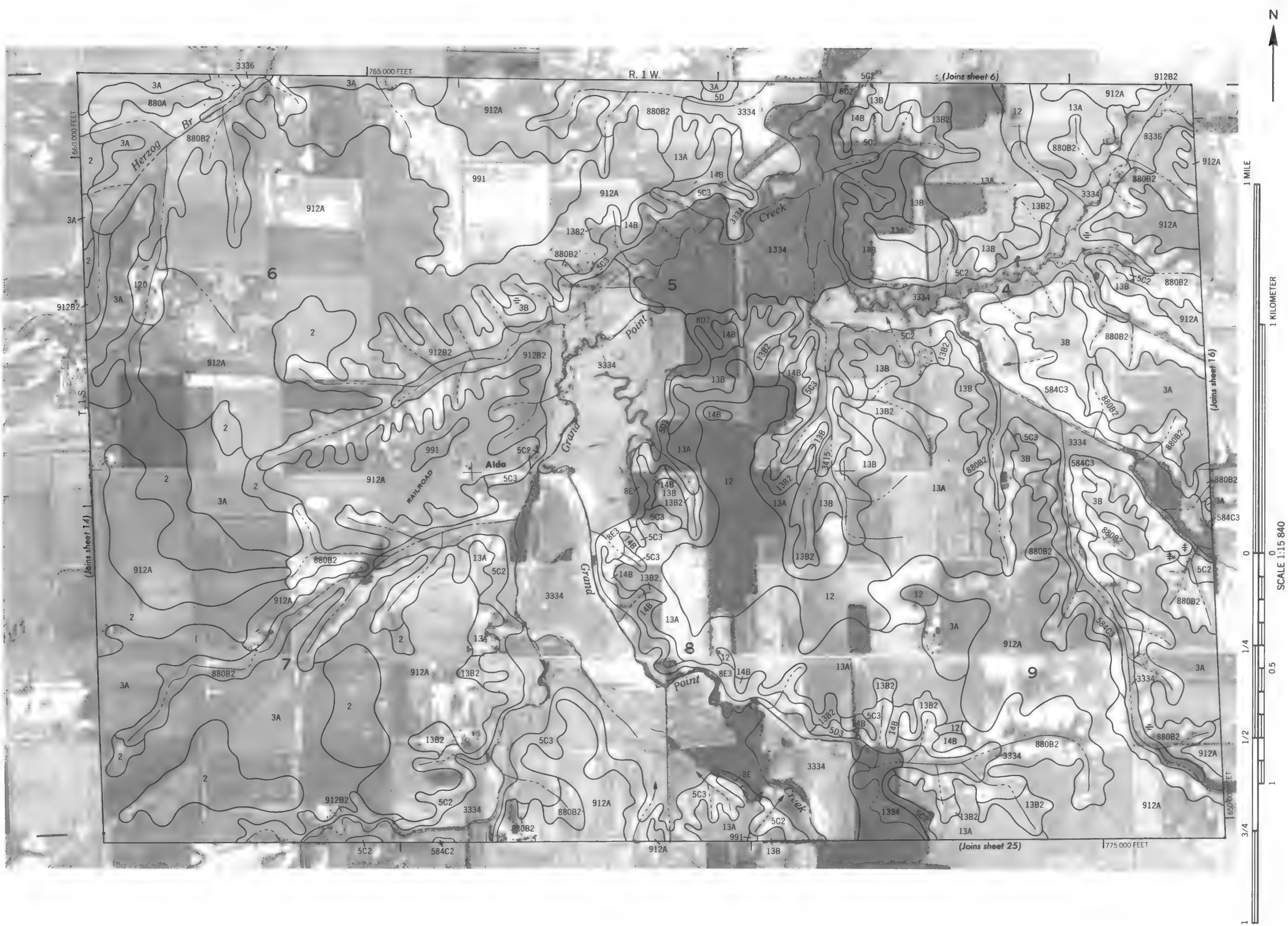

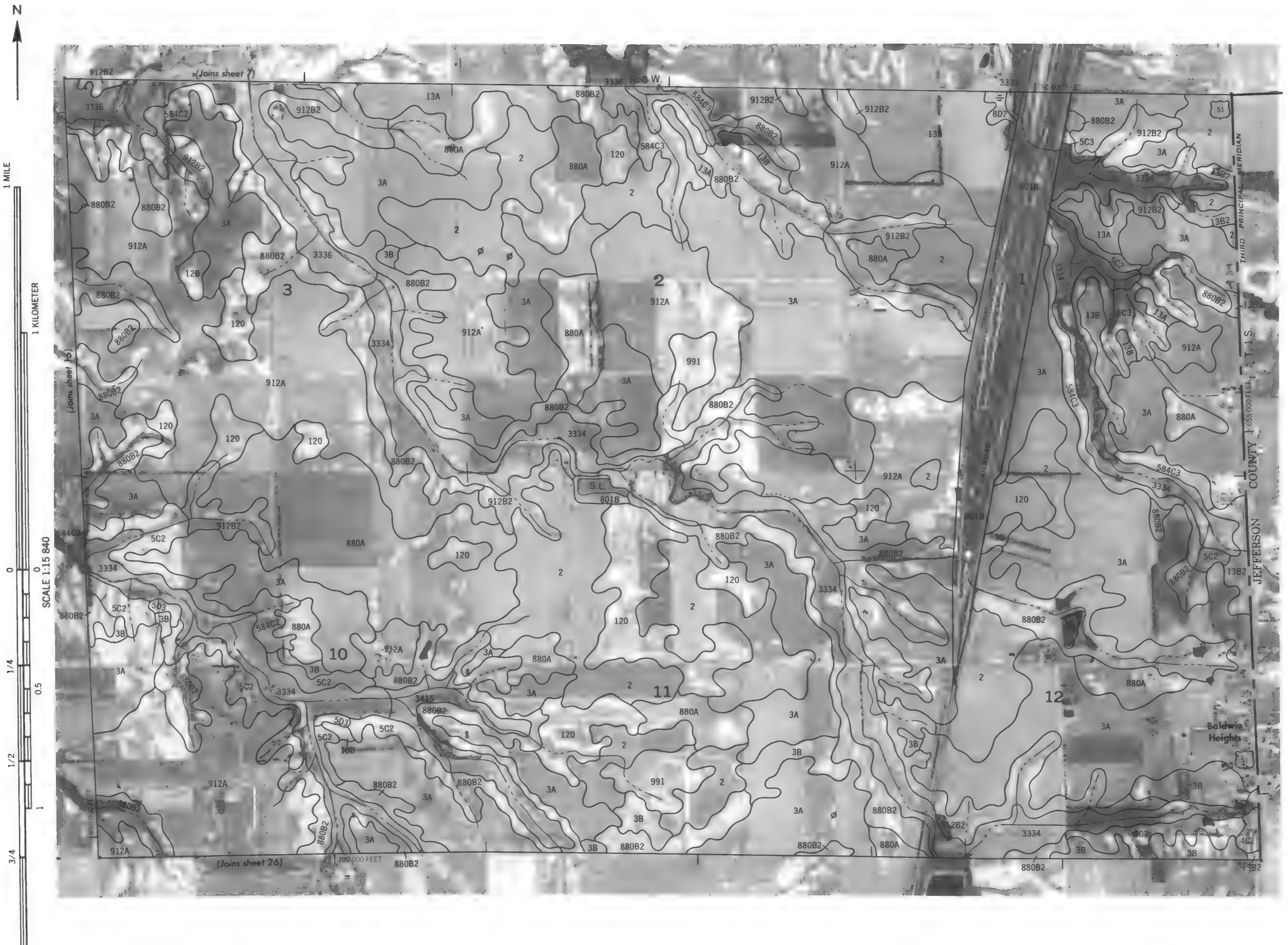

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N

1 MILE

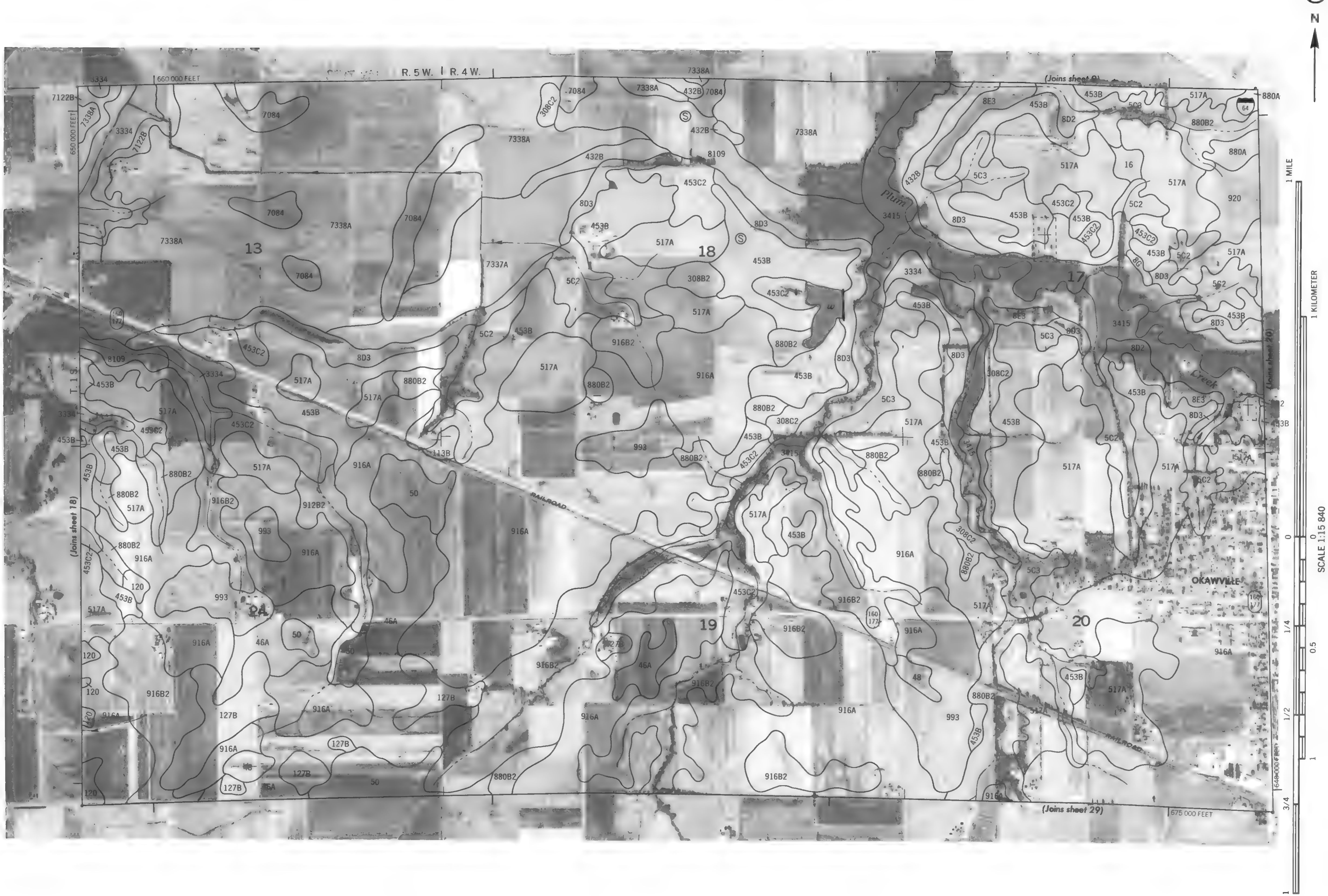
1 KILOMETER

SCALE 1:15 840

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

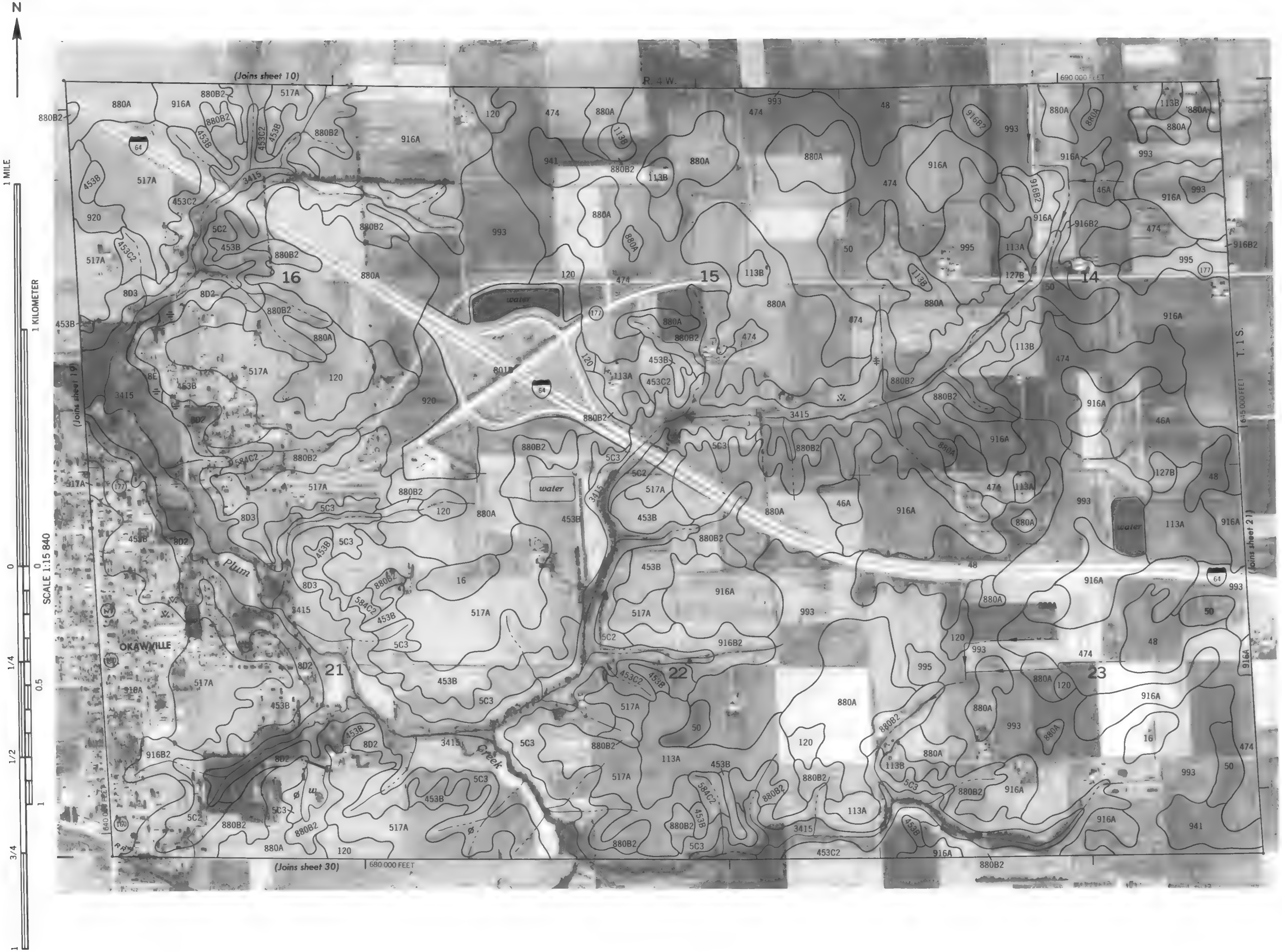
SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 18

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



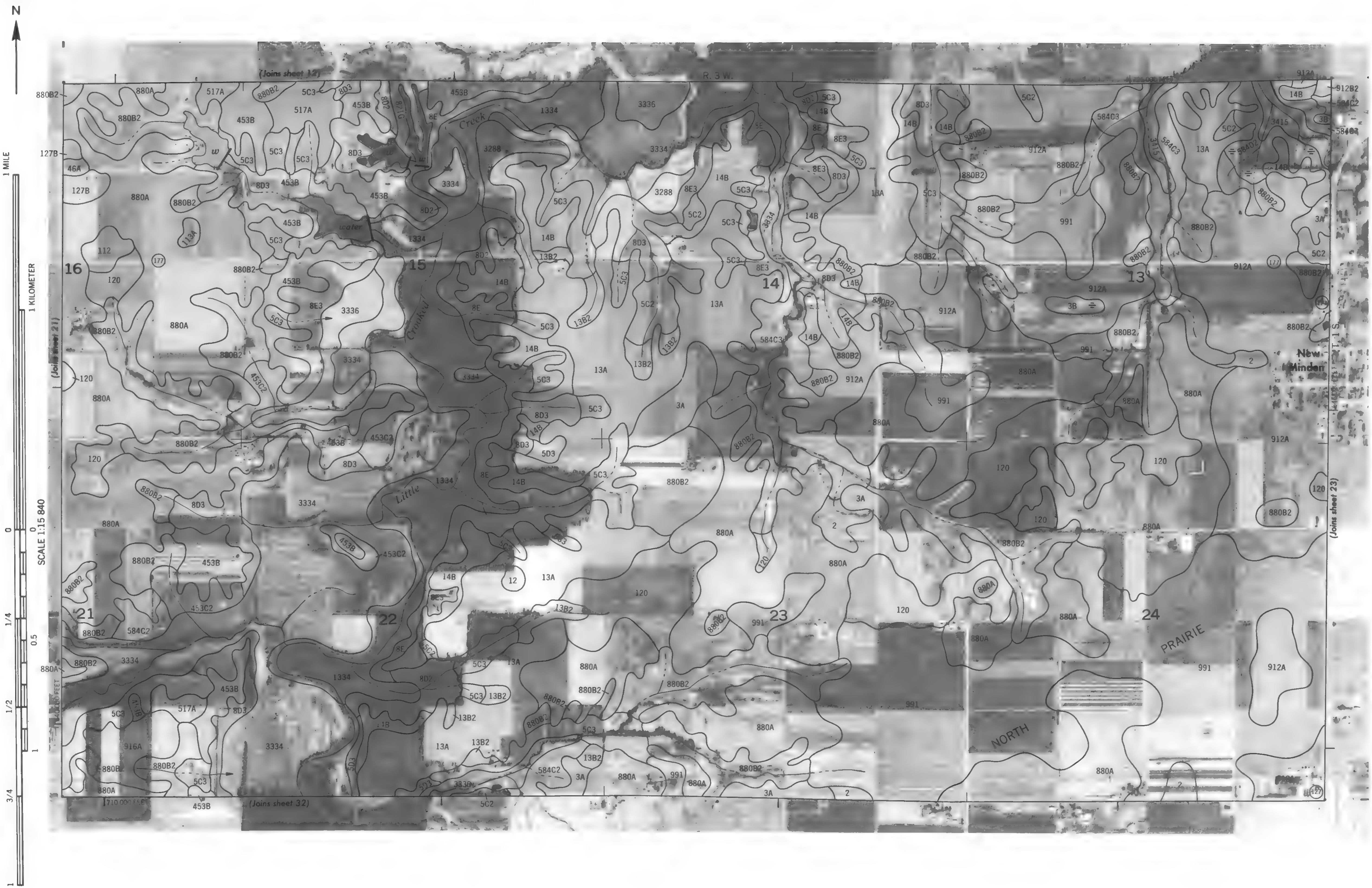
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 20



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



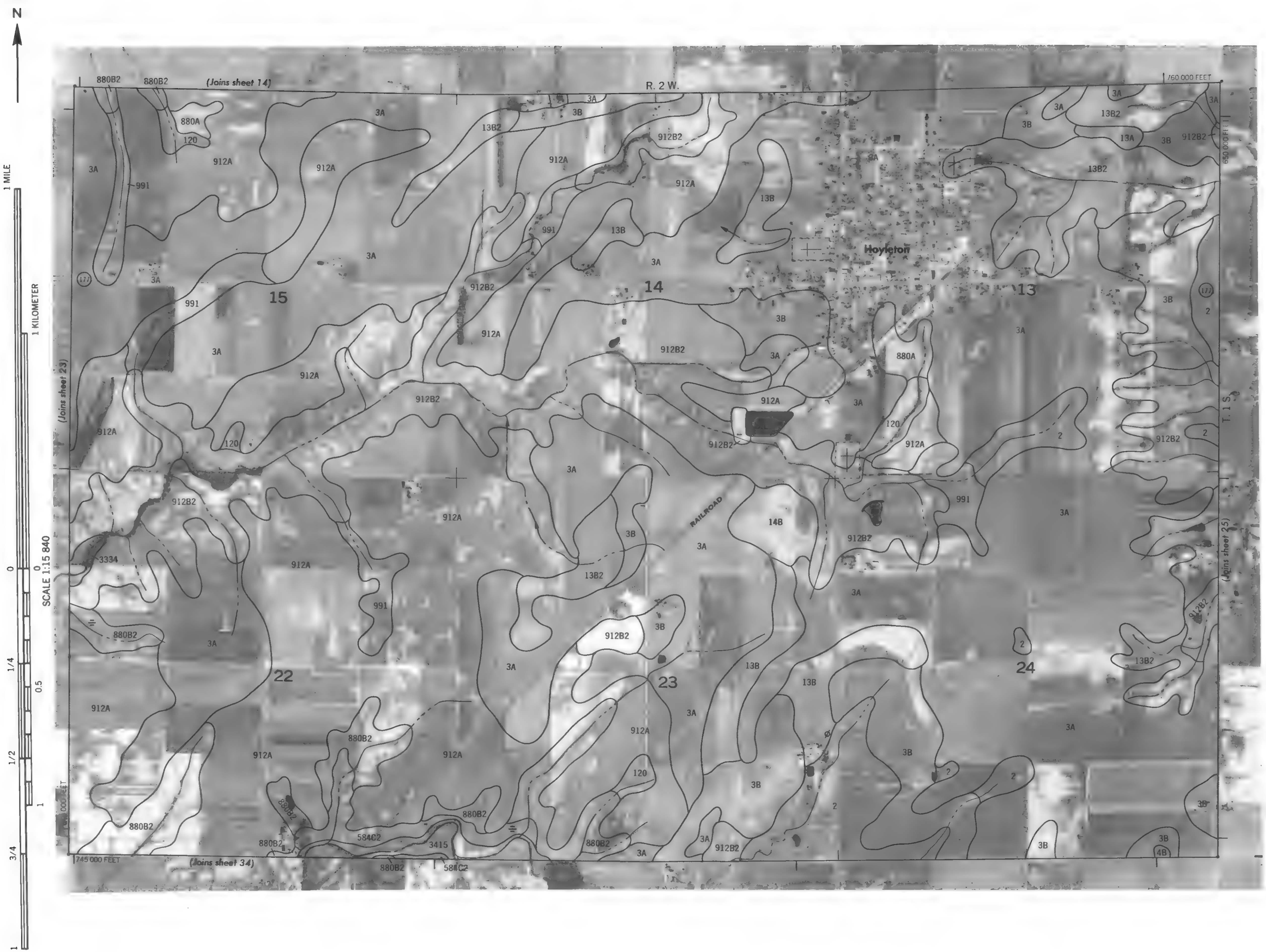
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

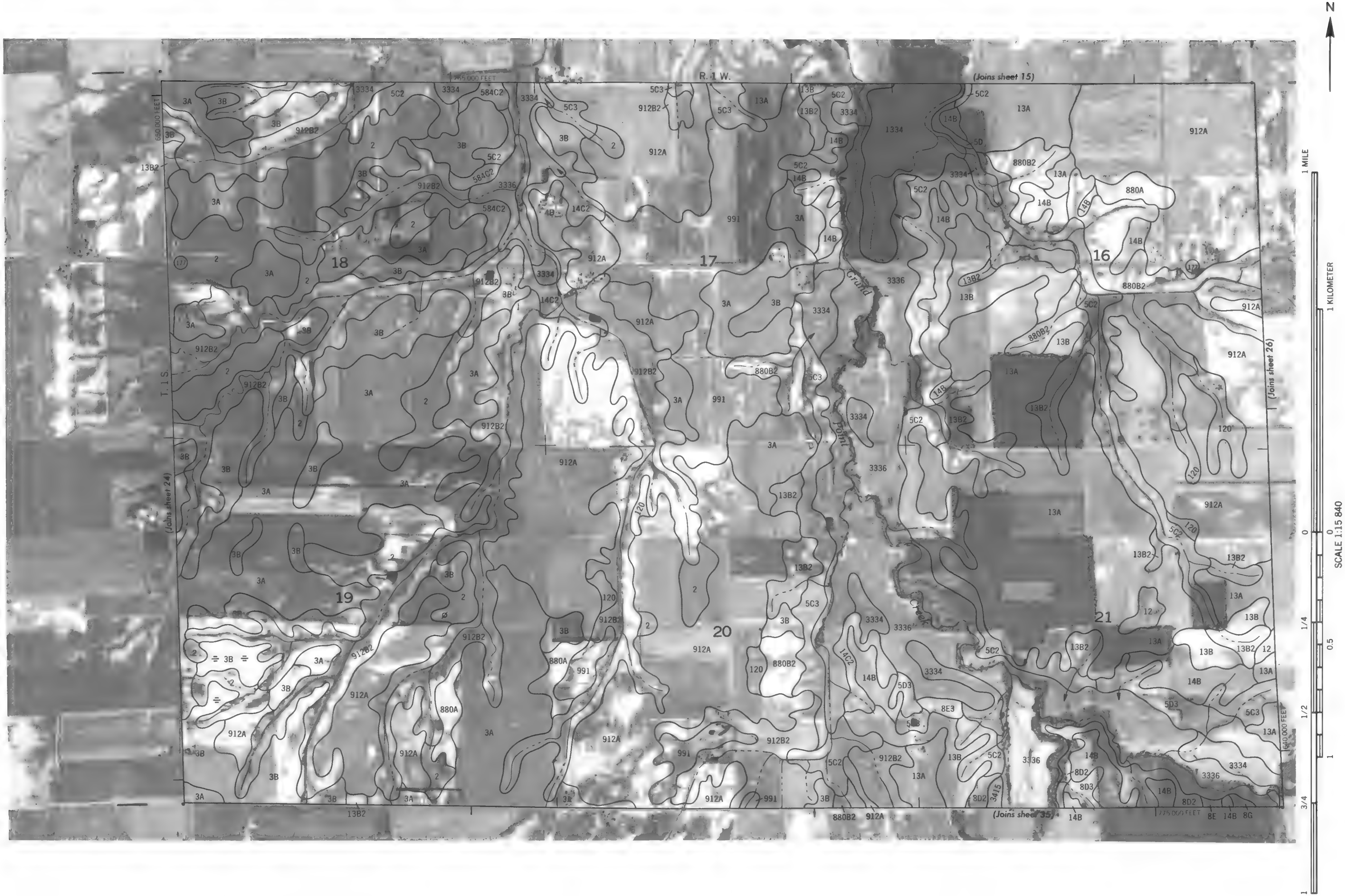
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
1/2
3/4
1
0
0.5
1

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 24



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
1/2
3/4
1
0
0.5
1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

29

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
0.5
1/2
1
3/4
1

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 30

N

1 MILE

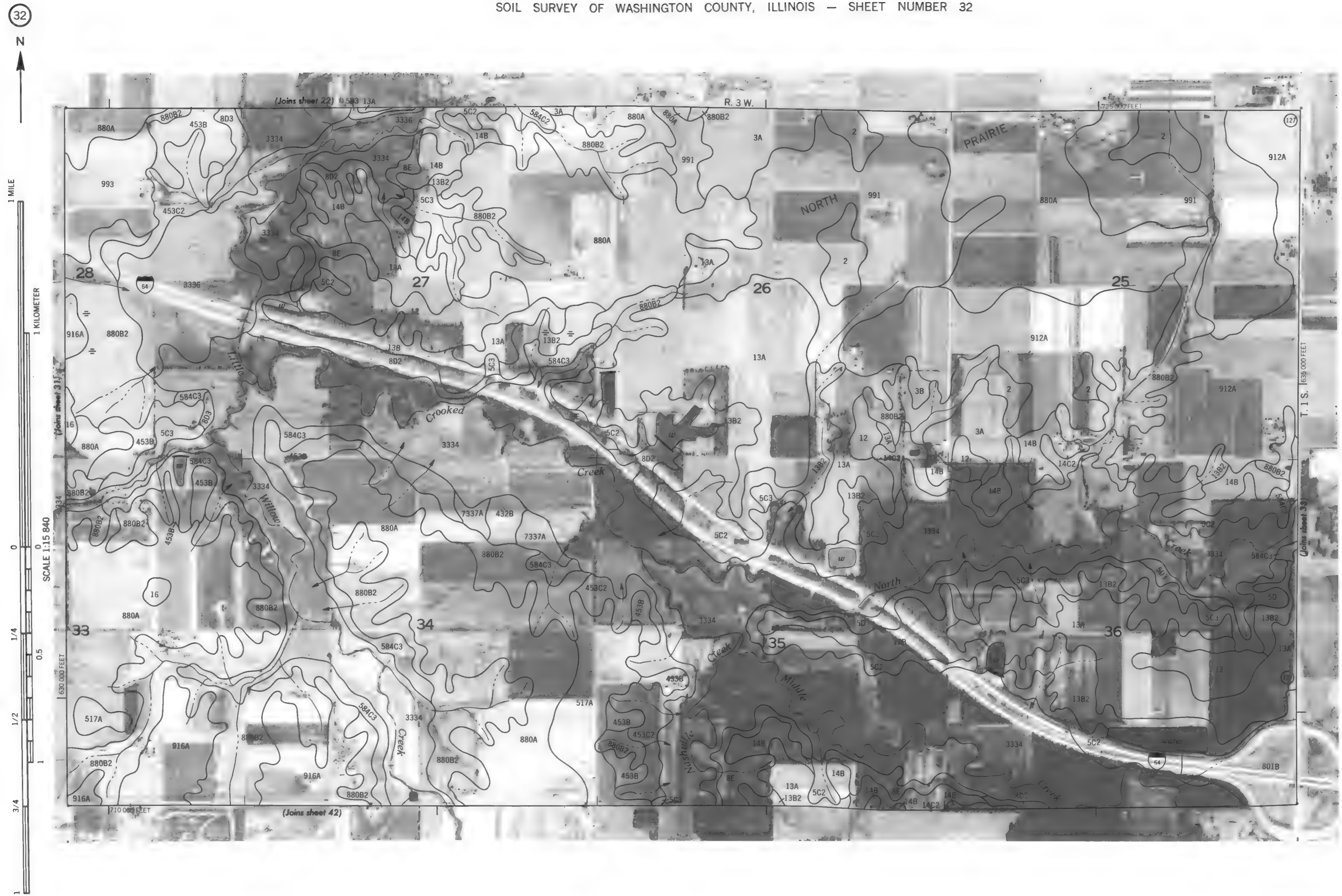
1 KILOMETER

SCALE 1:15 840

0 0 1/4 0.5 1/2 1 3/4 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

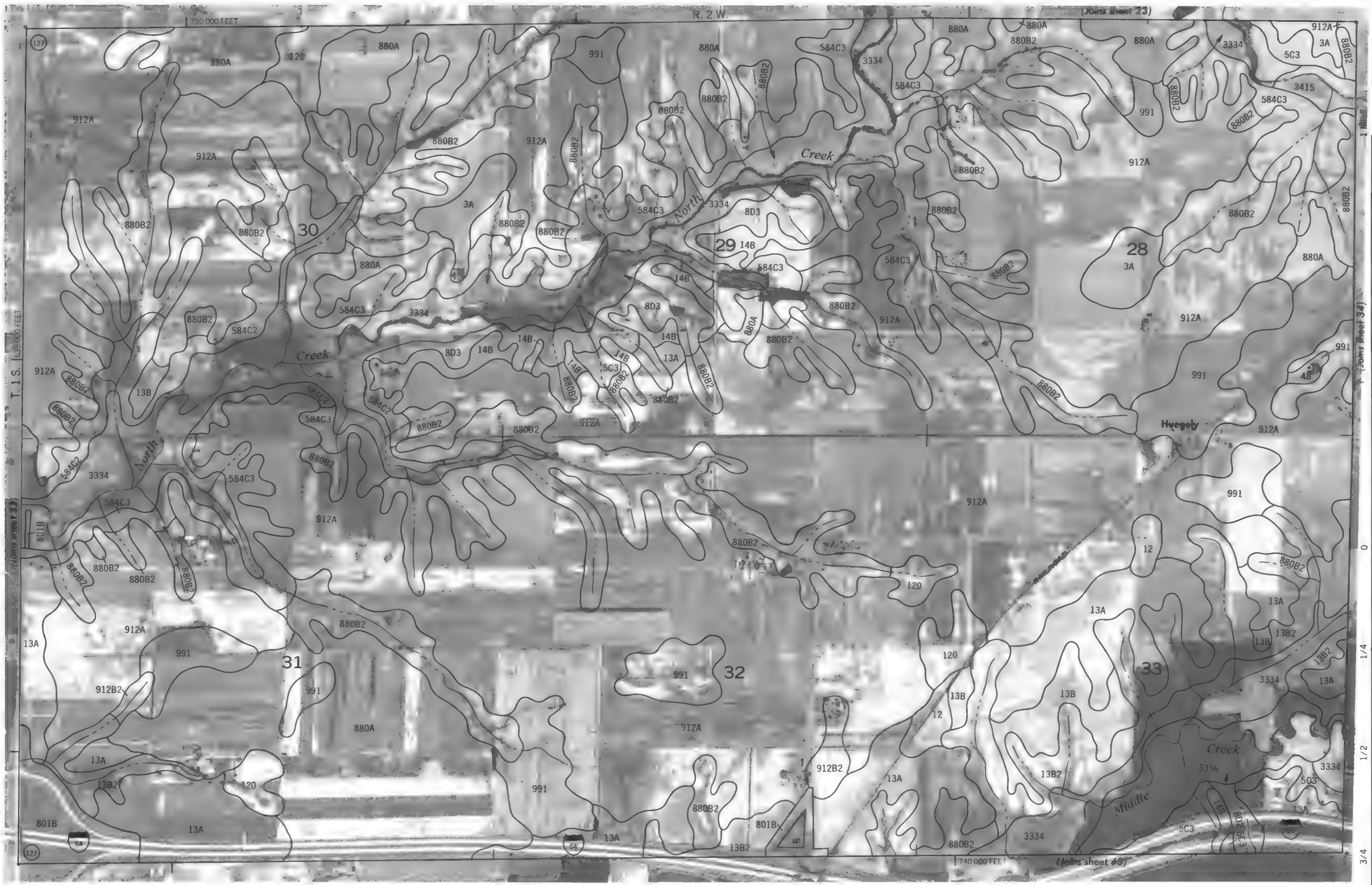
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

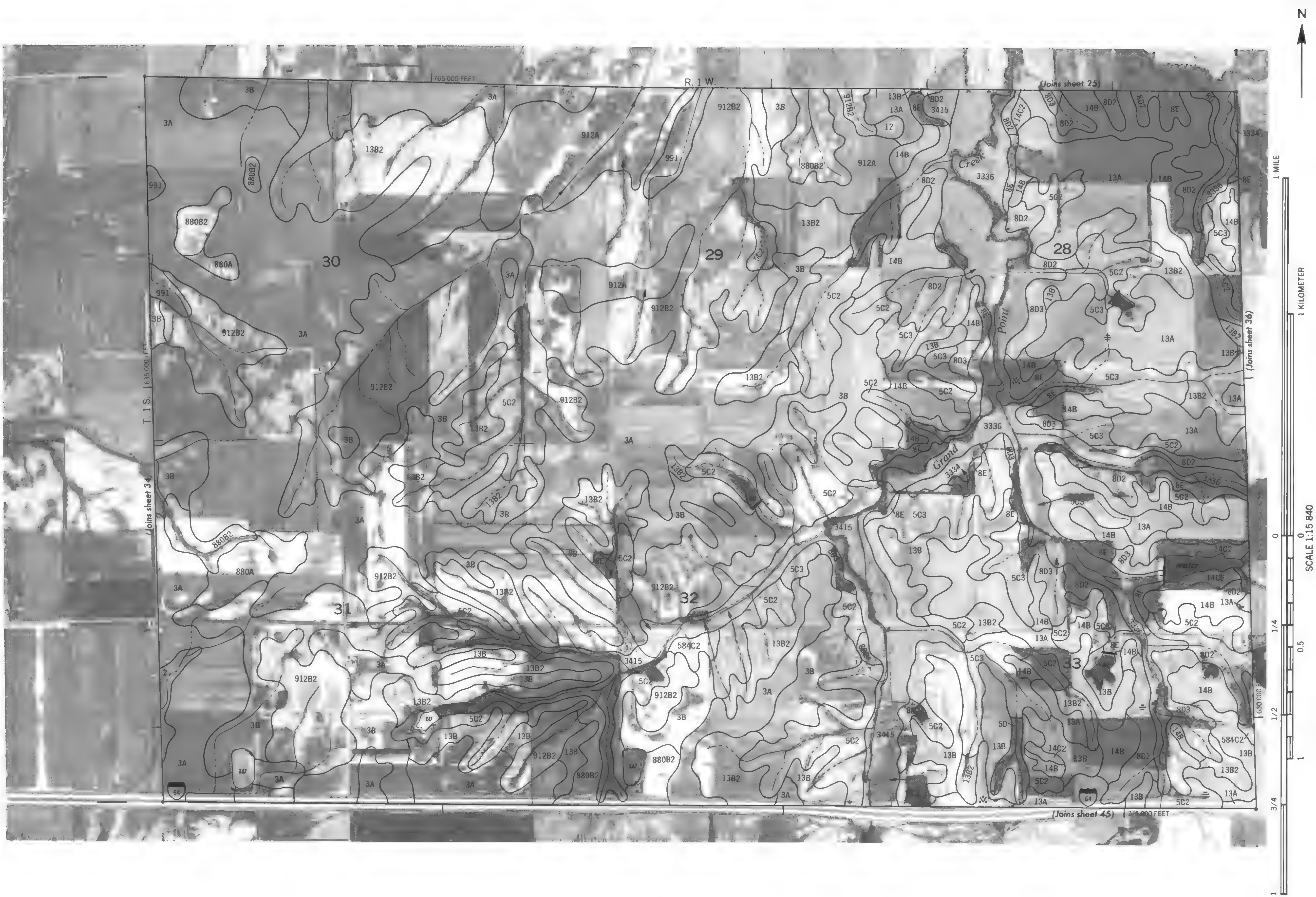
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

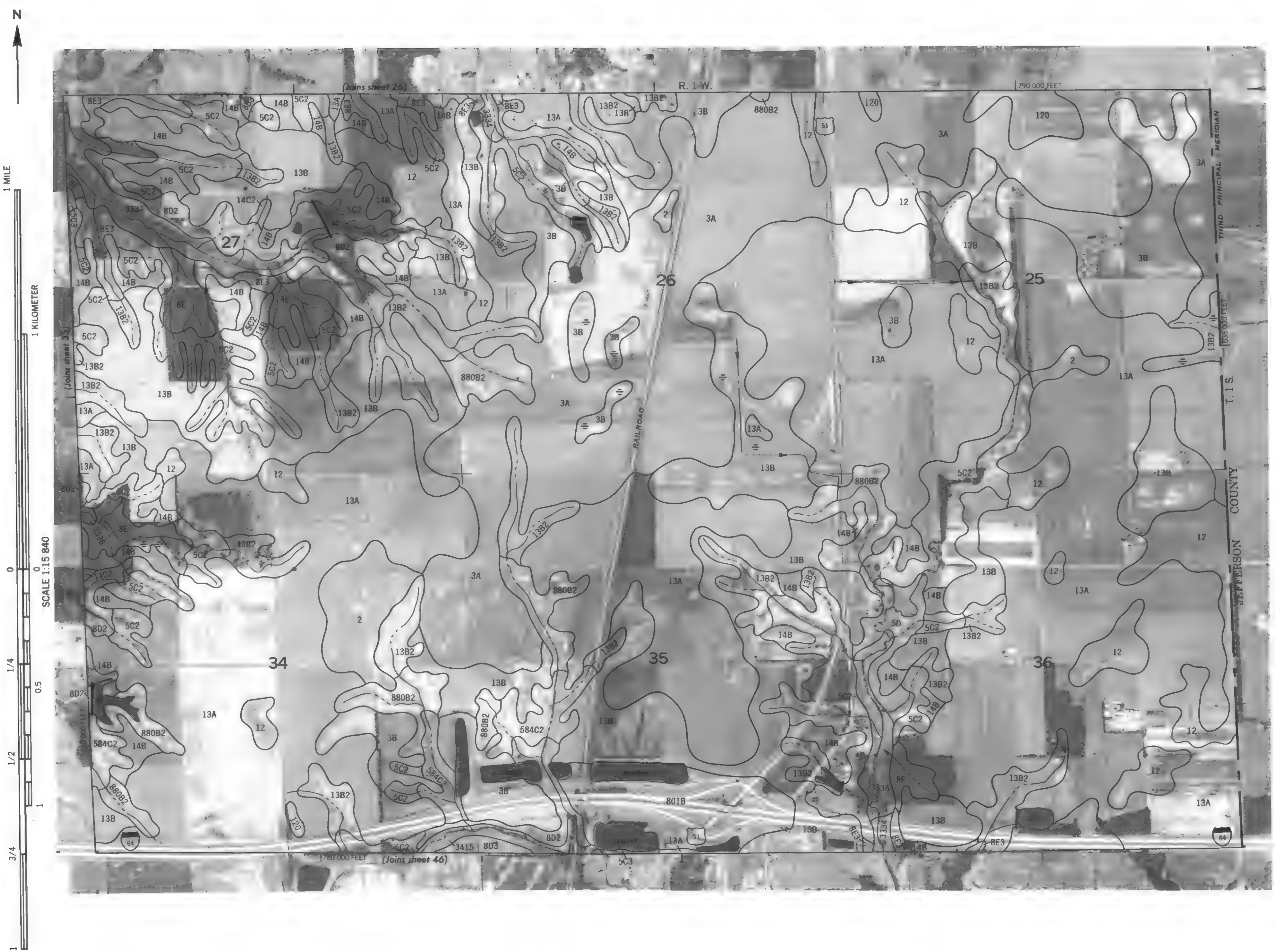


1 KILOMETER
0
1/4
1/2
3/4
1 MILE
0
0.5
1
SCALE 1:15 840

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.





This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

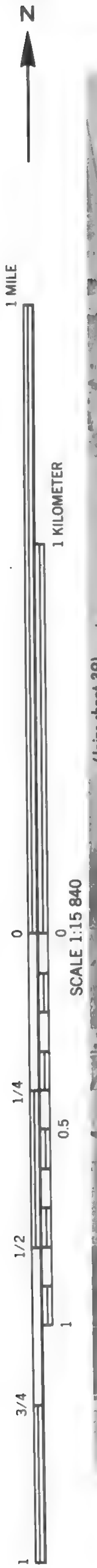
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

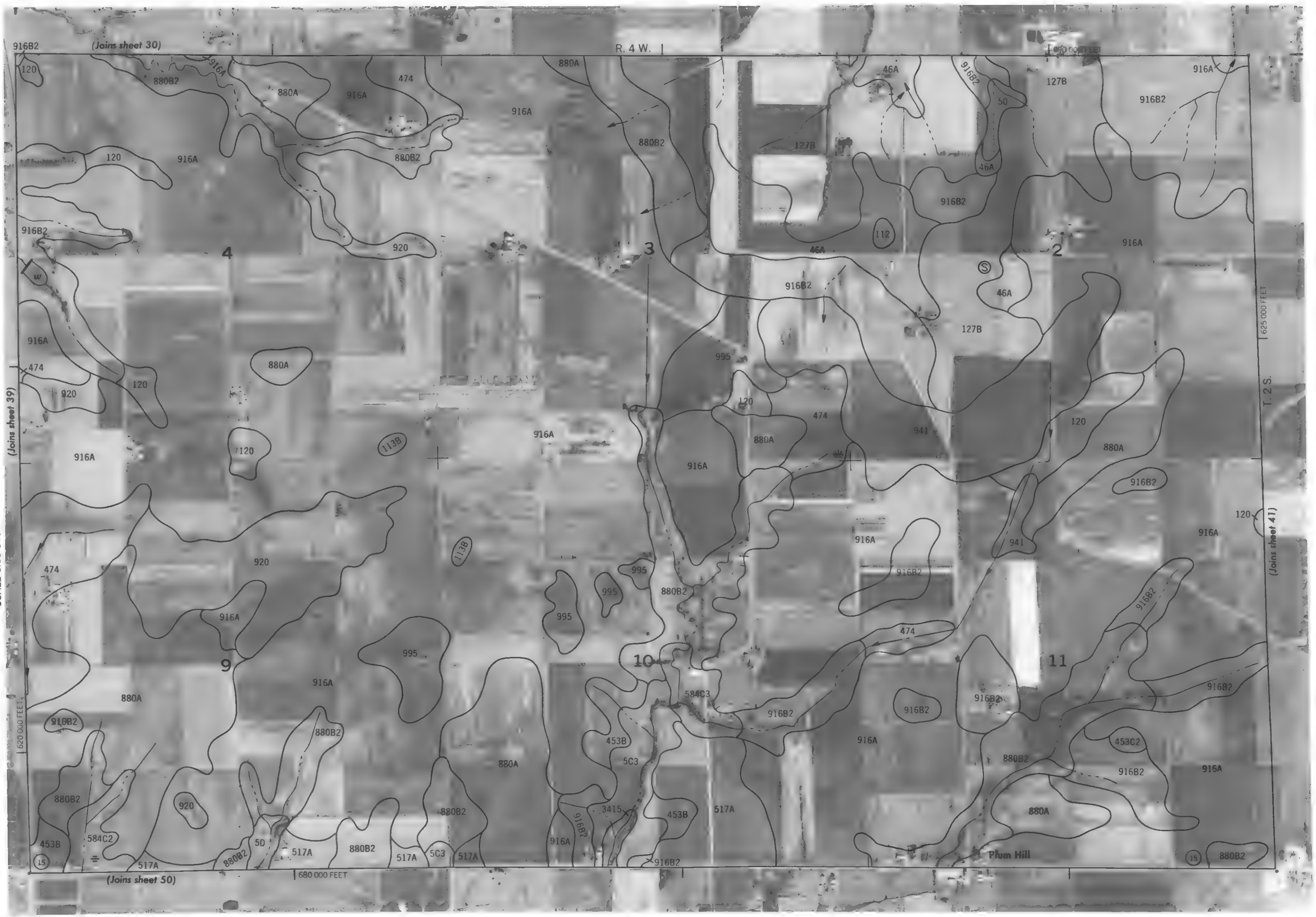
SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 38

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

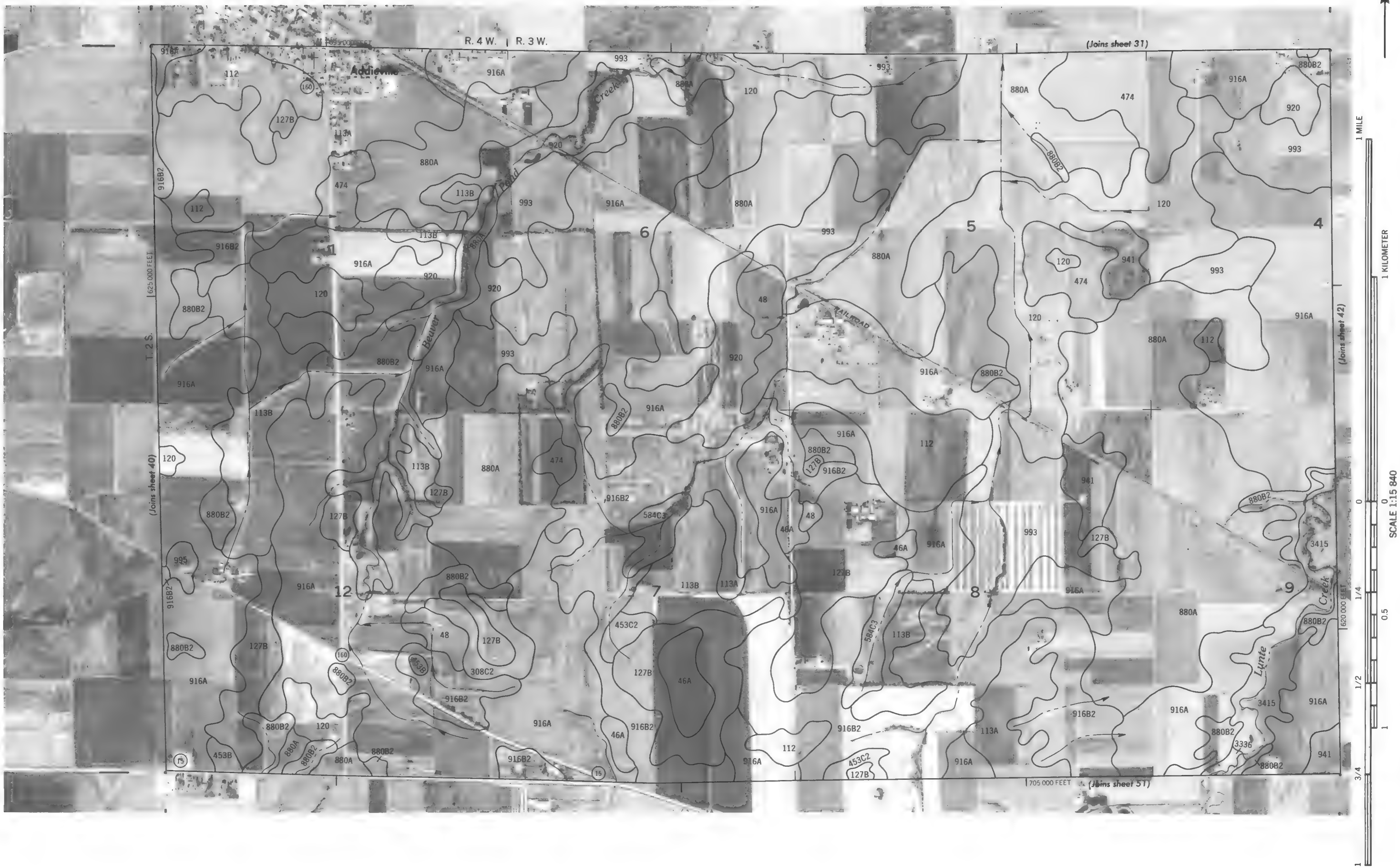
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 40





This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

43

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 MILE

1 KILOMETER

SCALE 1:15 840

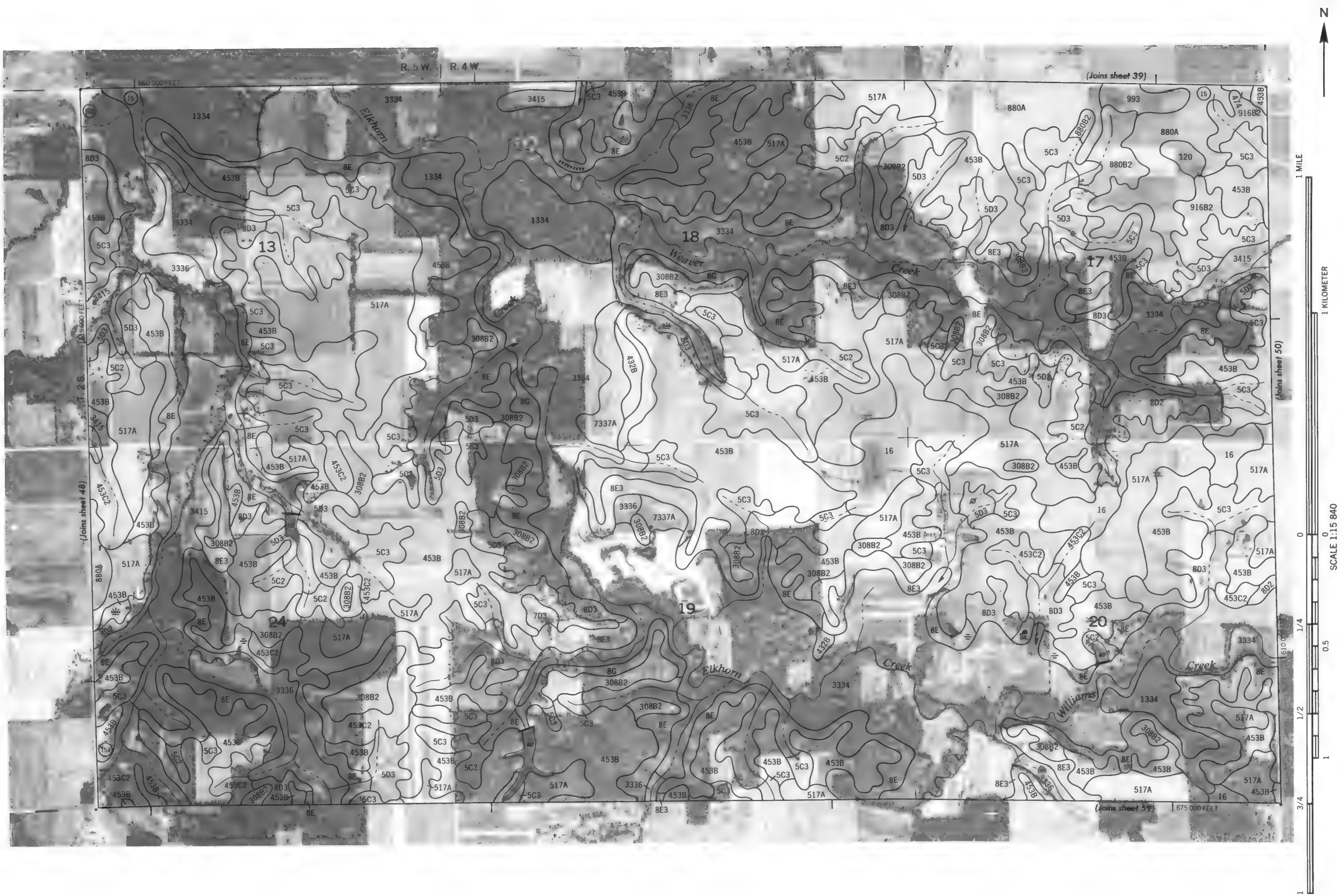
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 48

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

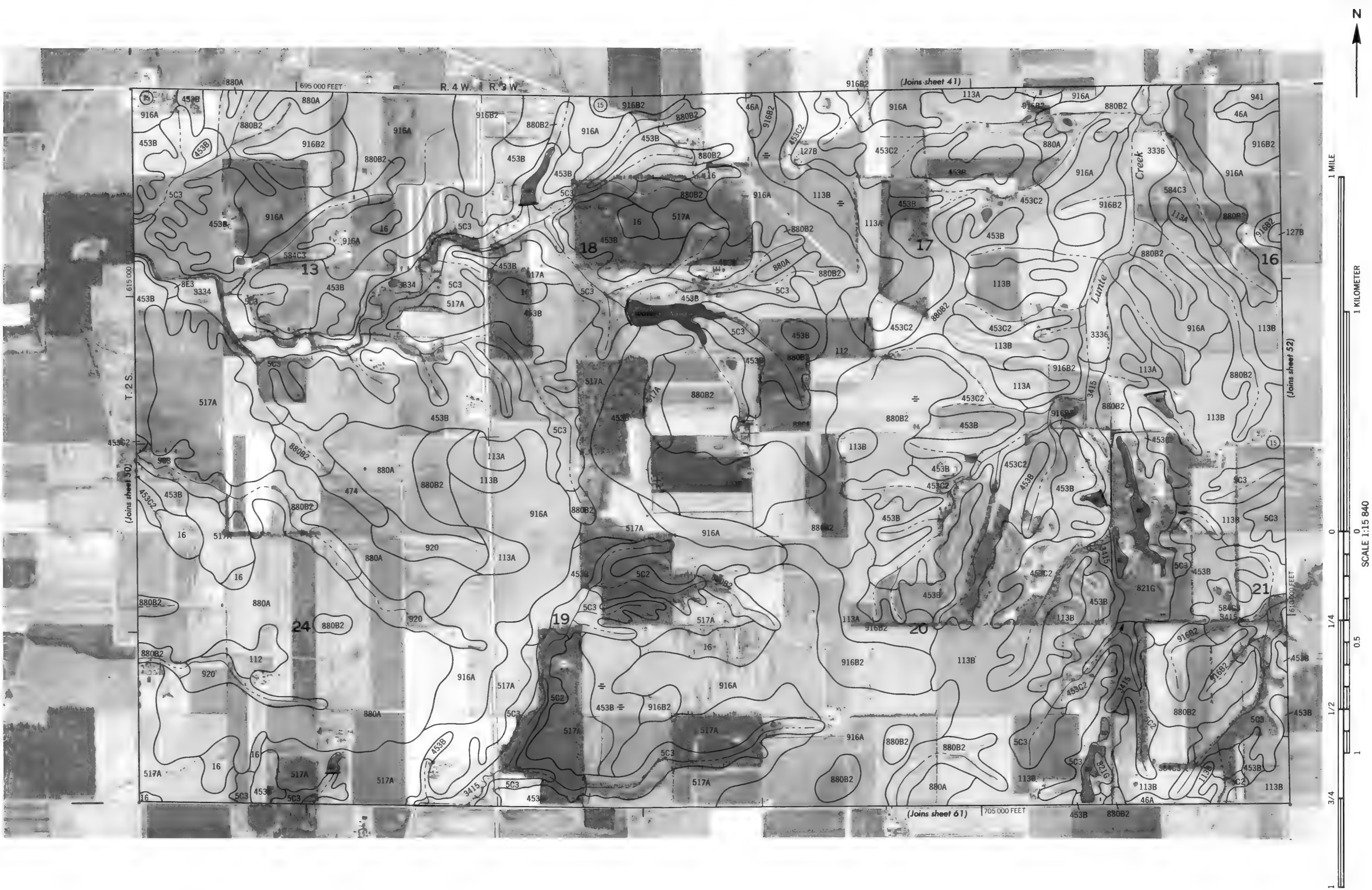
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



N

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



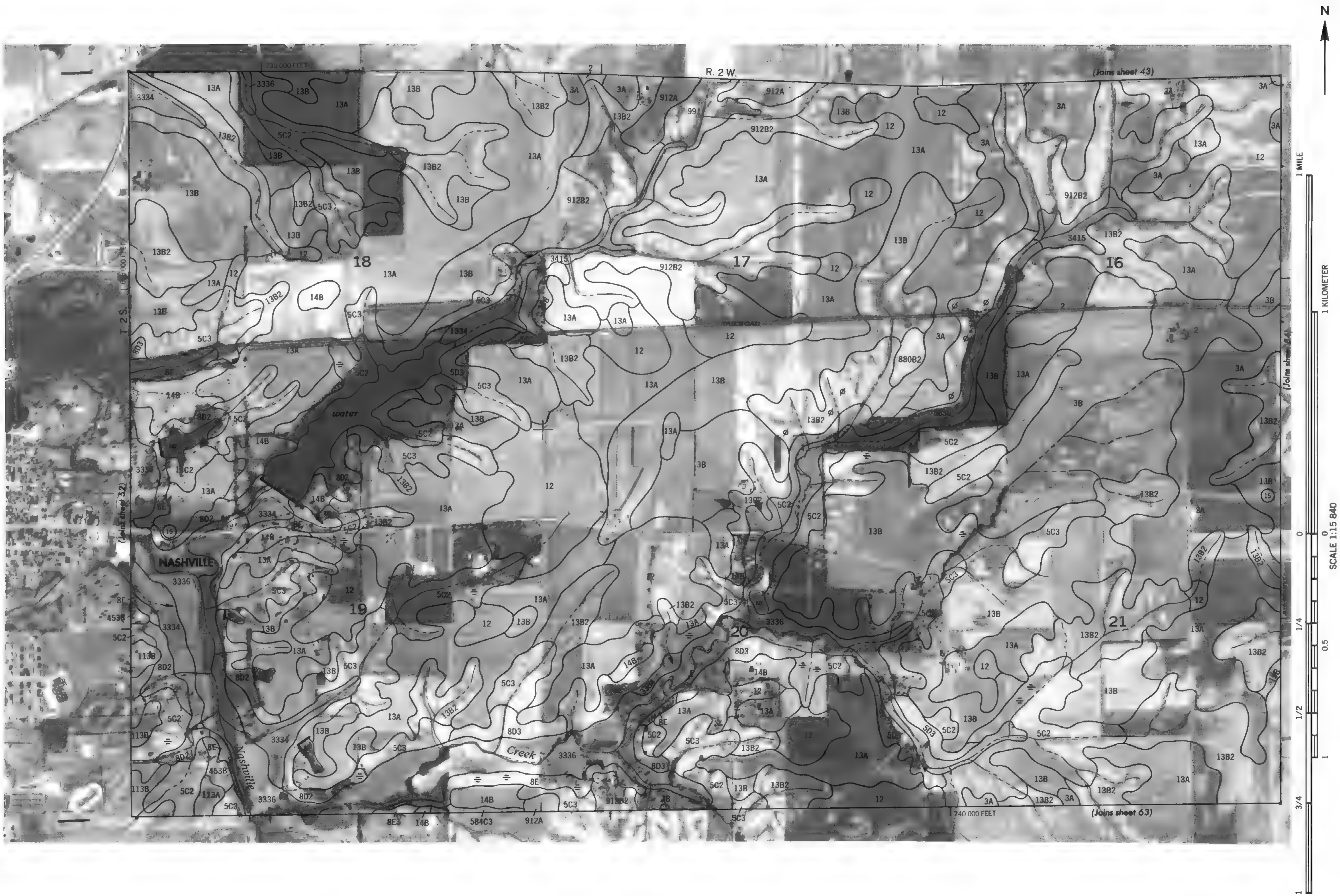
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 52

N

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 MILE

1 KILOMETER

SCALE 1:15 840

0 0 1/4 0.5 1/2 1 3/4 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

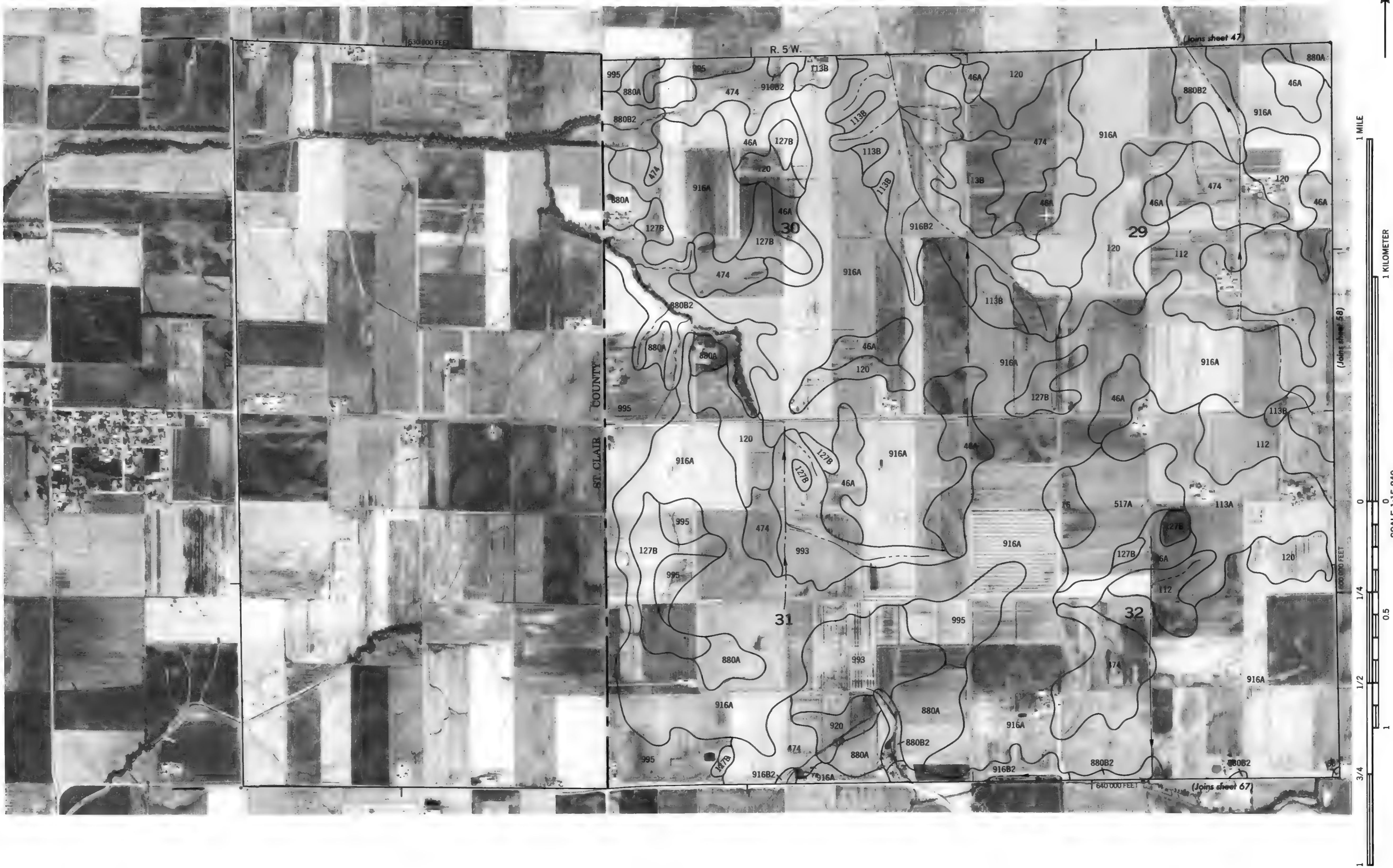
1 MILE

1 KILOMETER

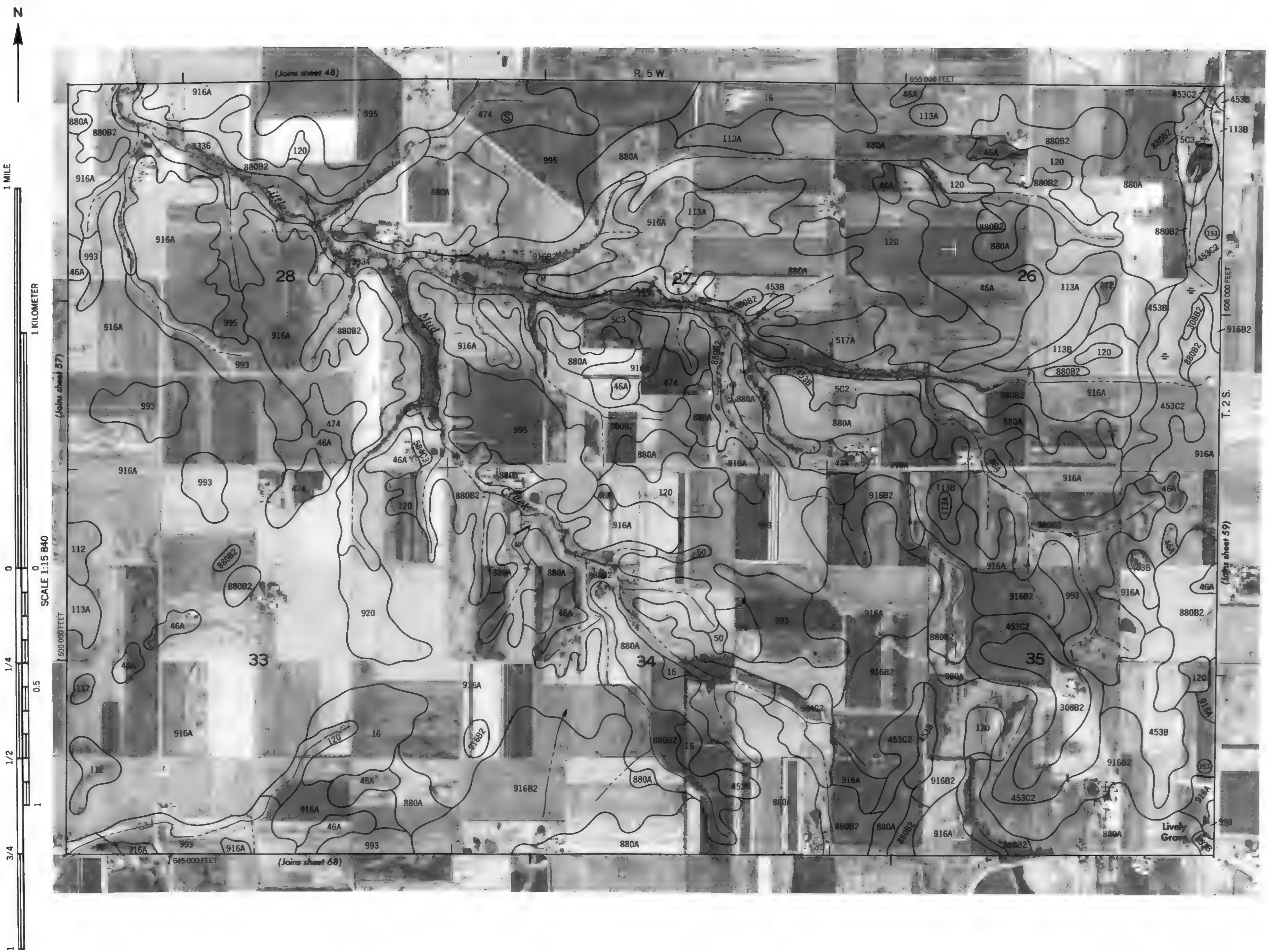
SCALE 1:15 840

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

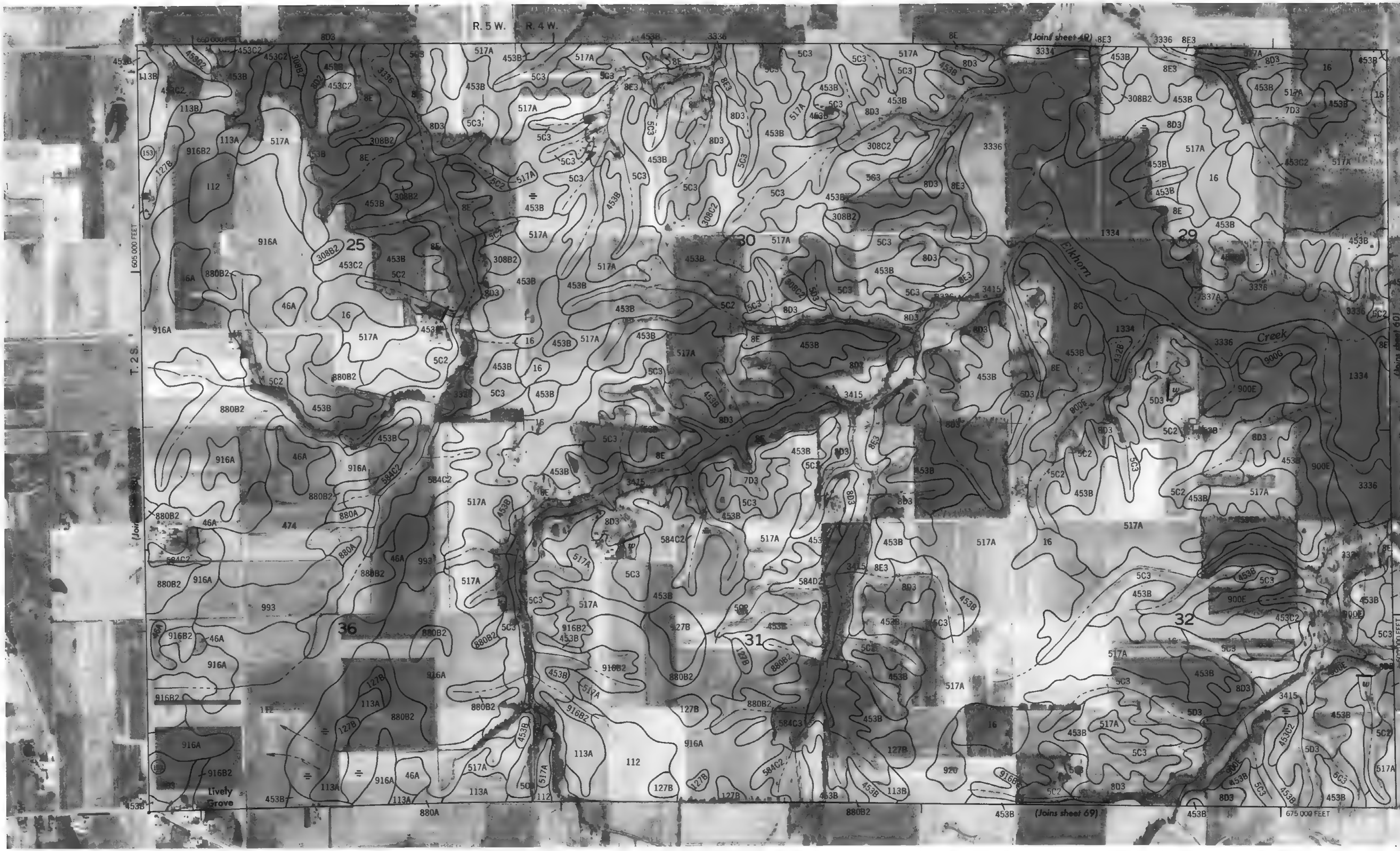


This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

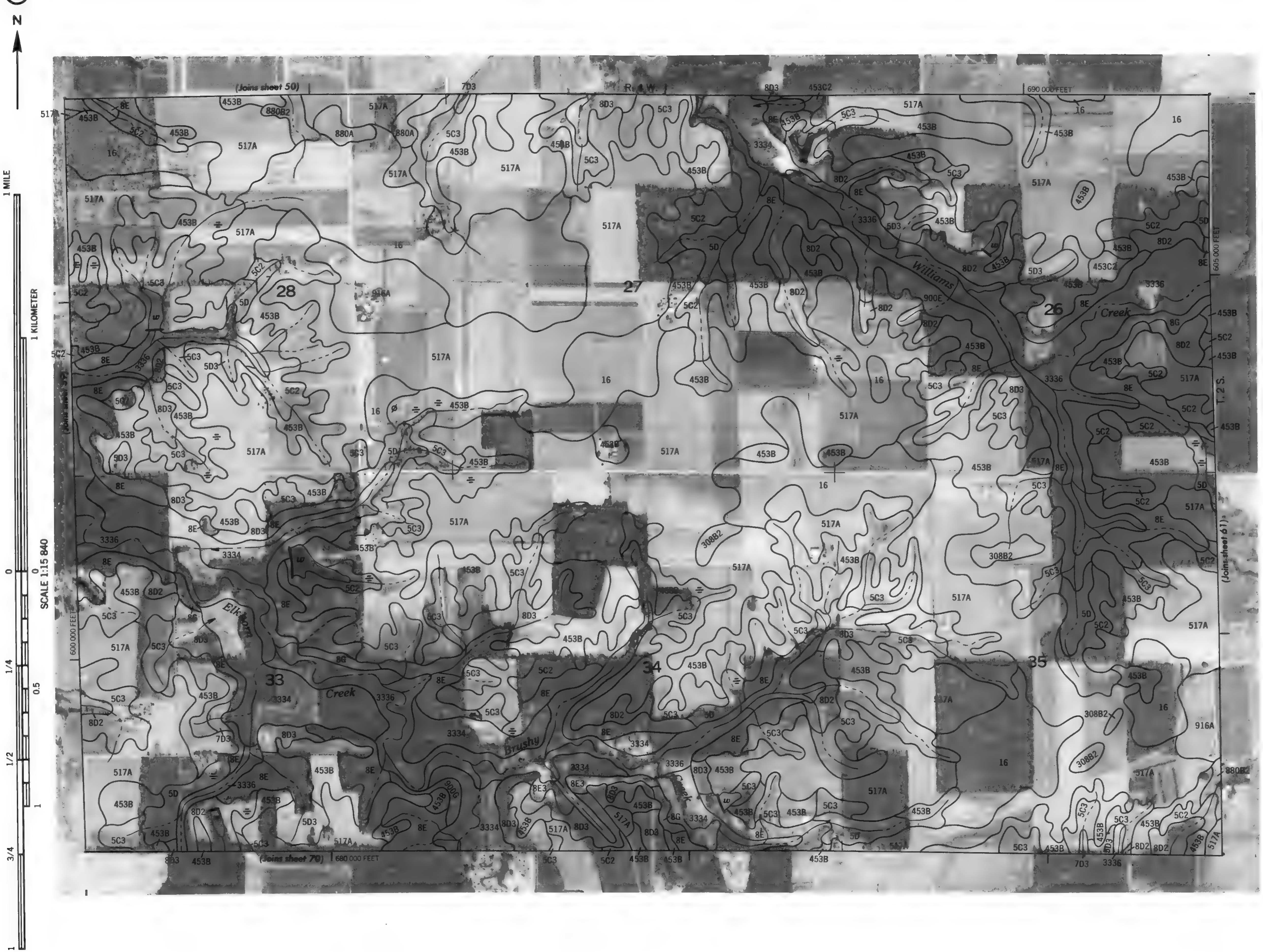


This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:15 840

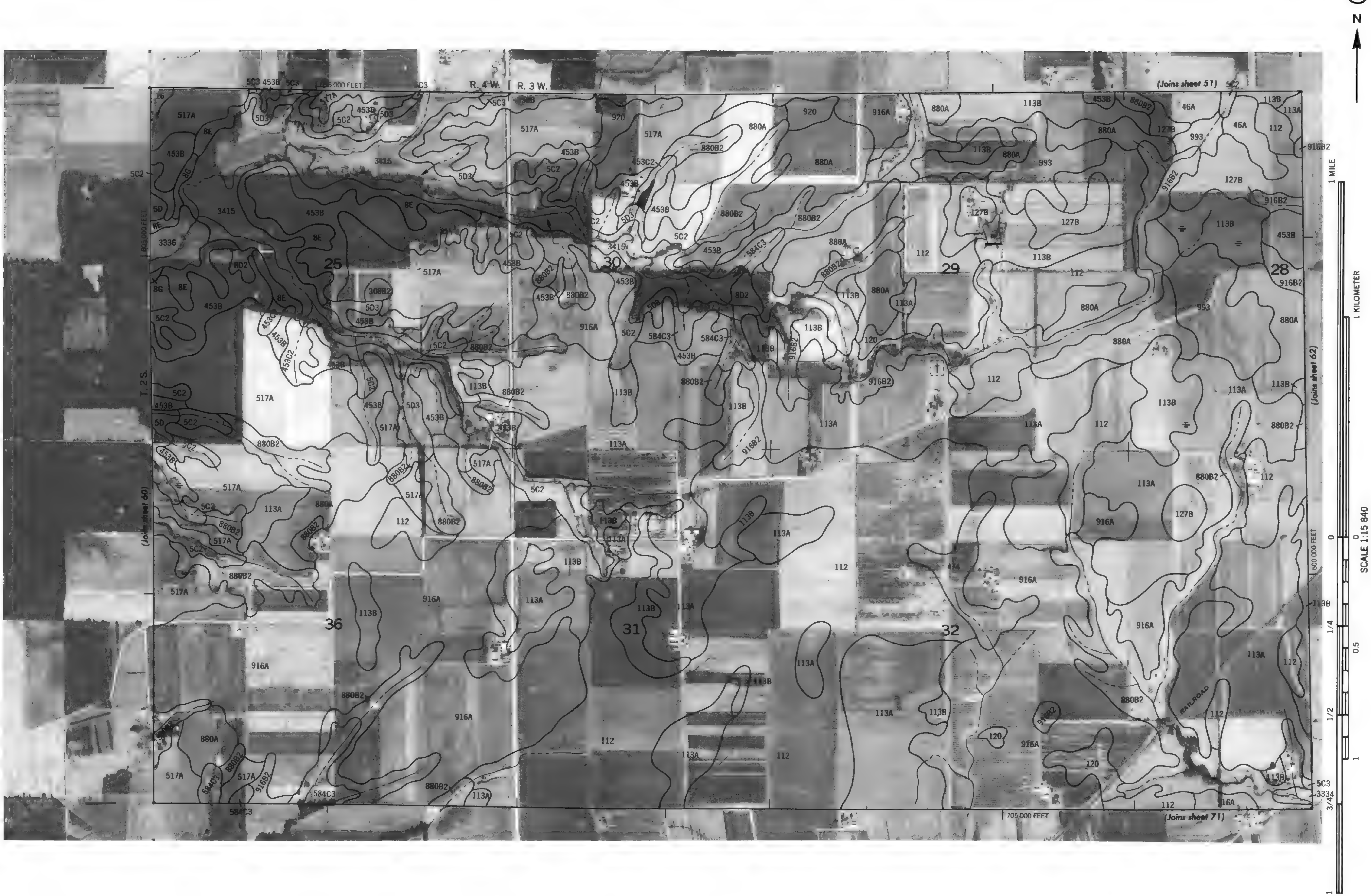
1 MILE

1 KILOMETER



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 61



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

SCALE 1:15 840

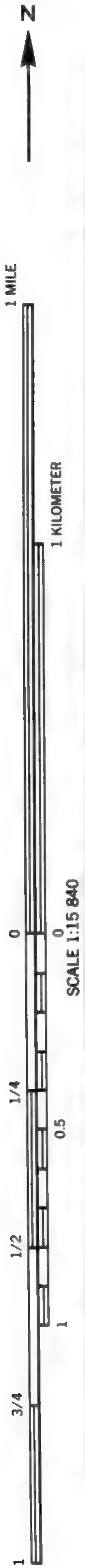
1 MILE

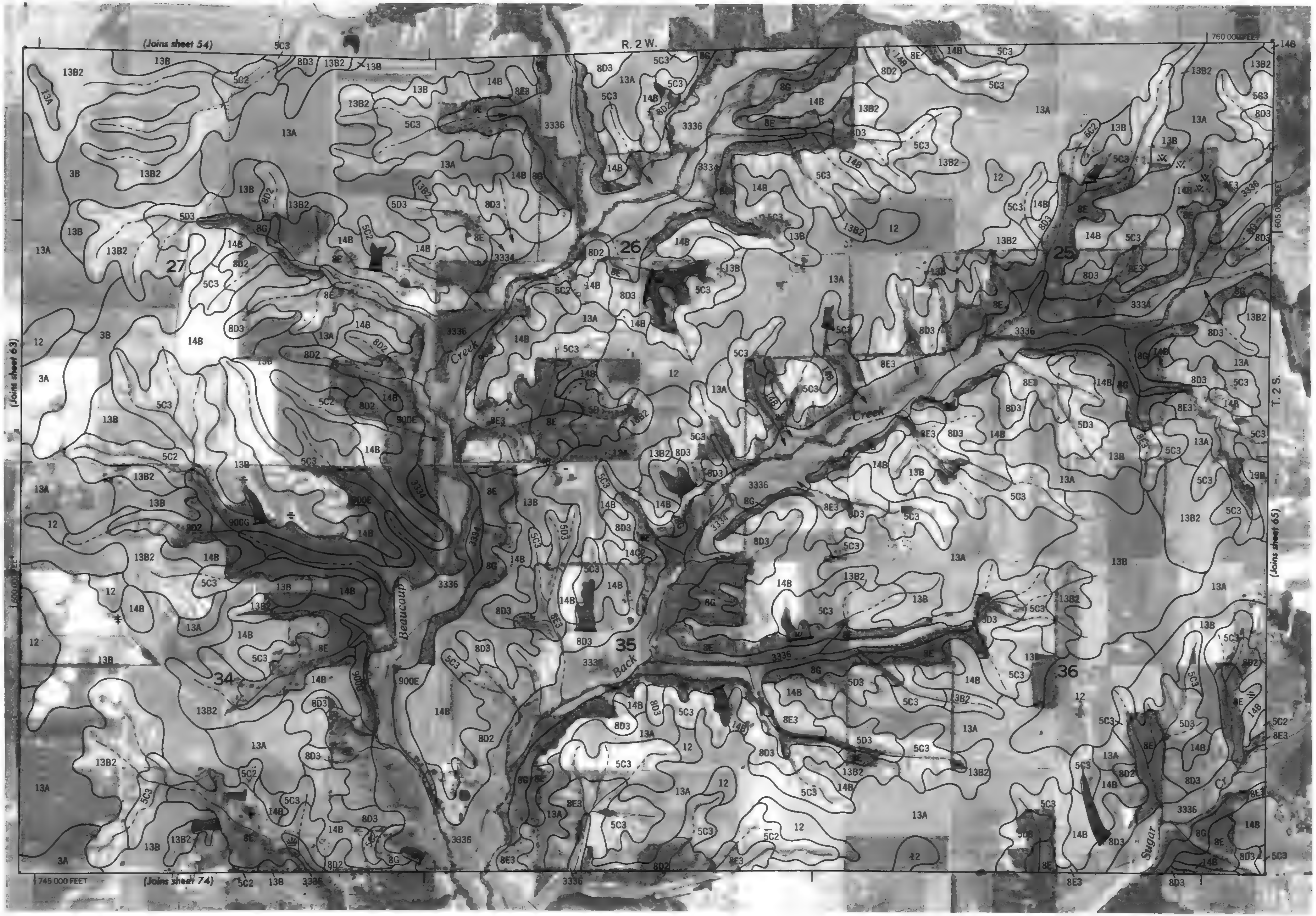
1 KILOMETER

0 | 1/4 | 1/2 | 3/4 | 1

0 | 0.5 | 1

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 64





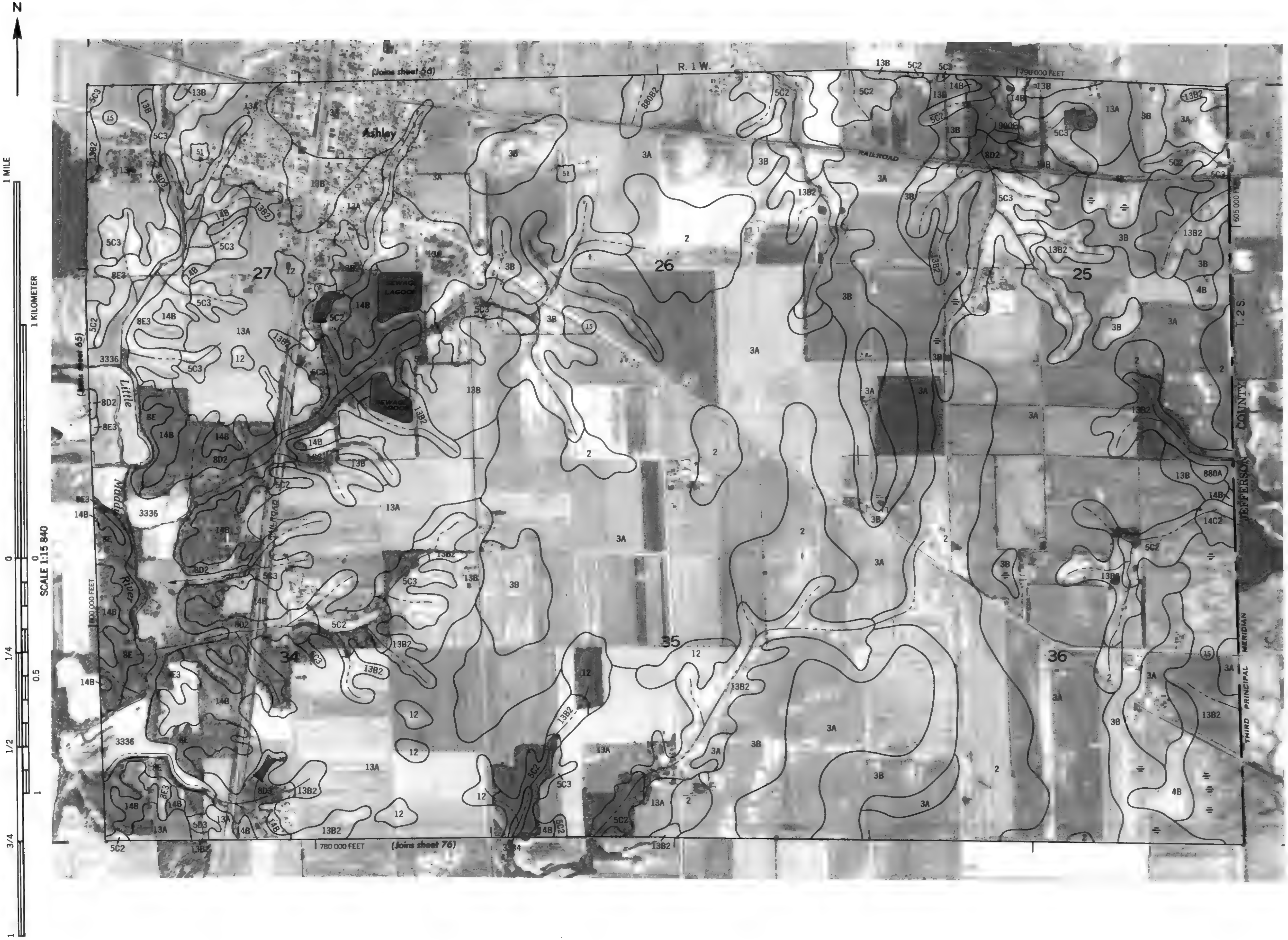
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

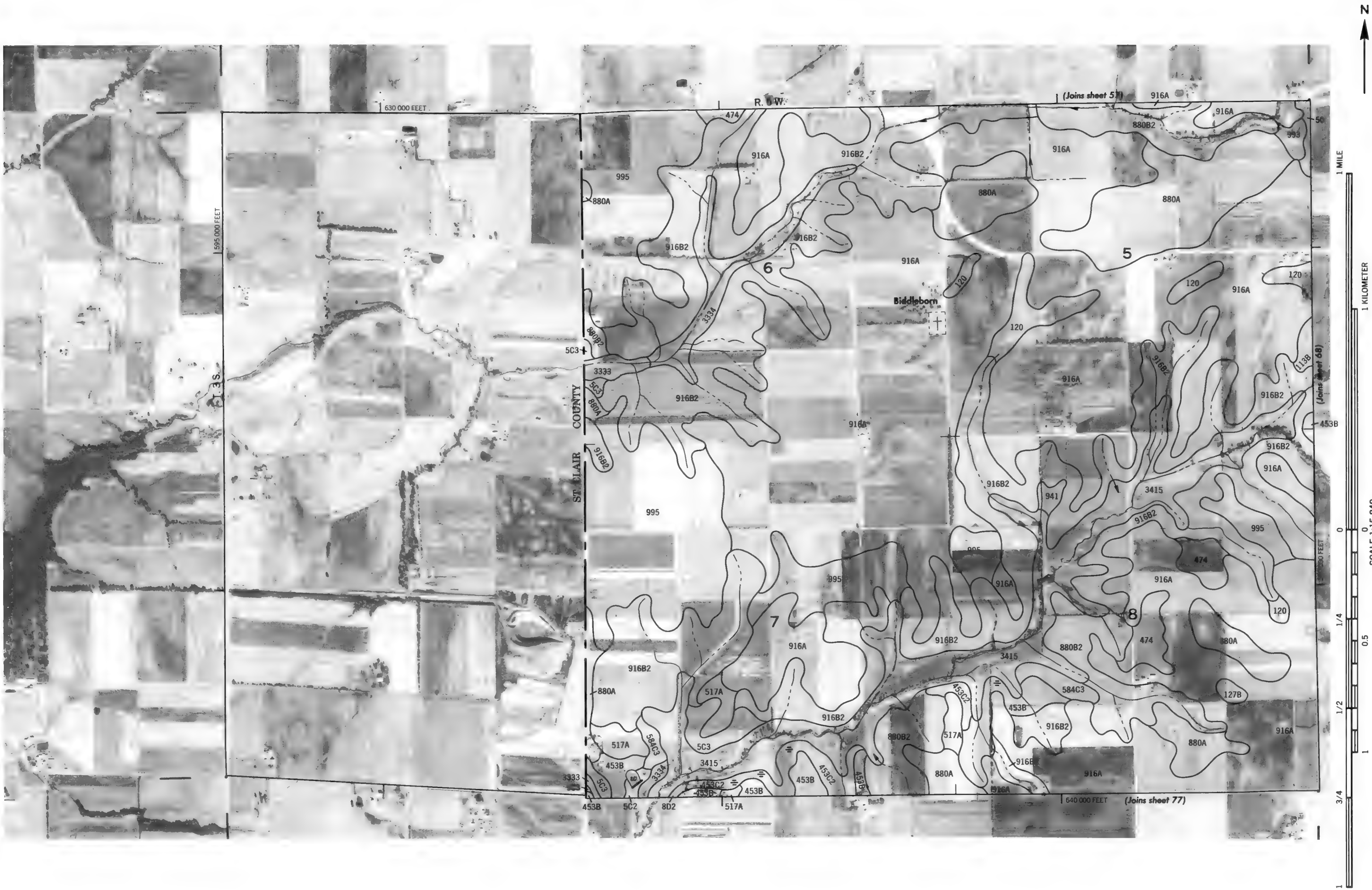
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
1/2
3/4
1
0
0.5
1

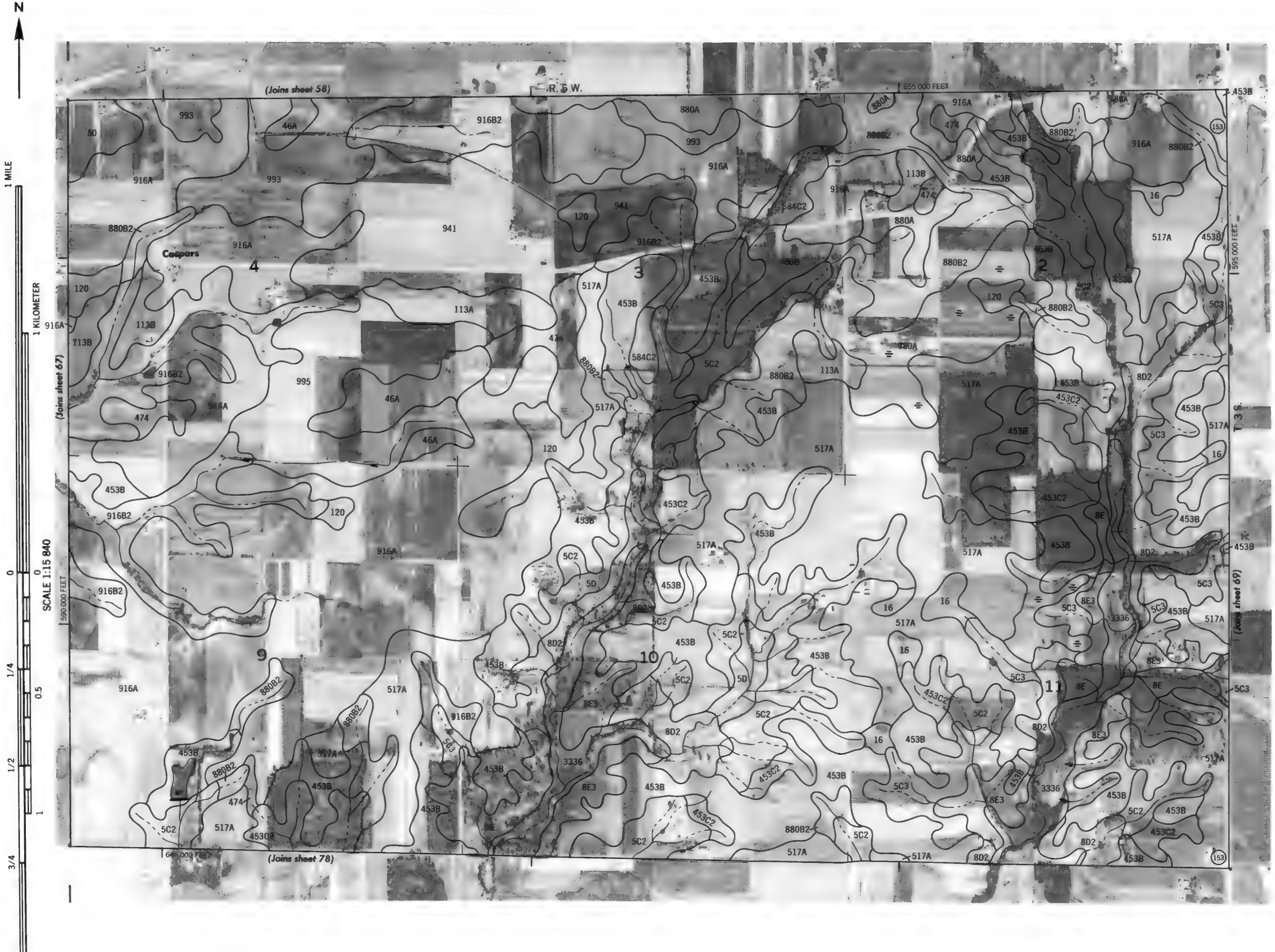
SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 66



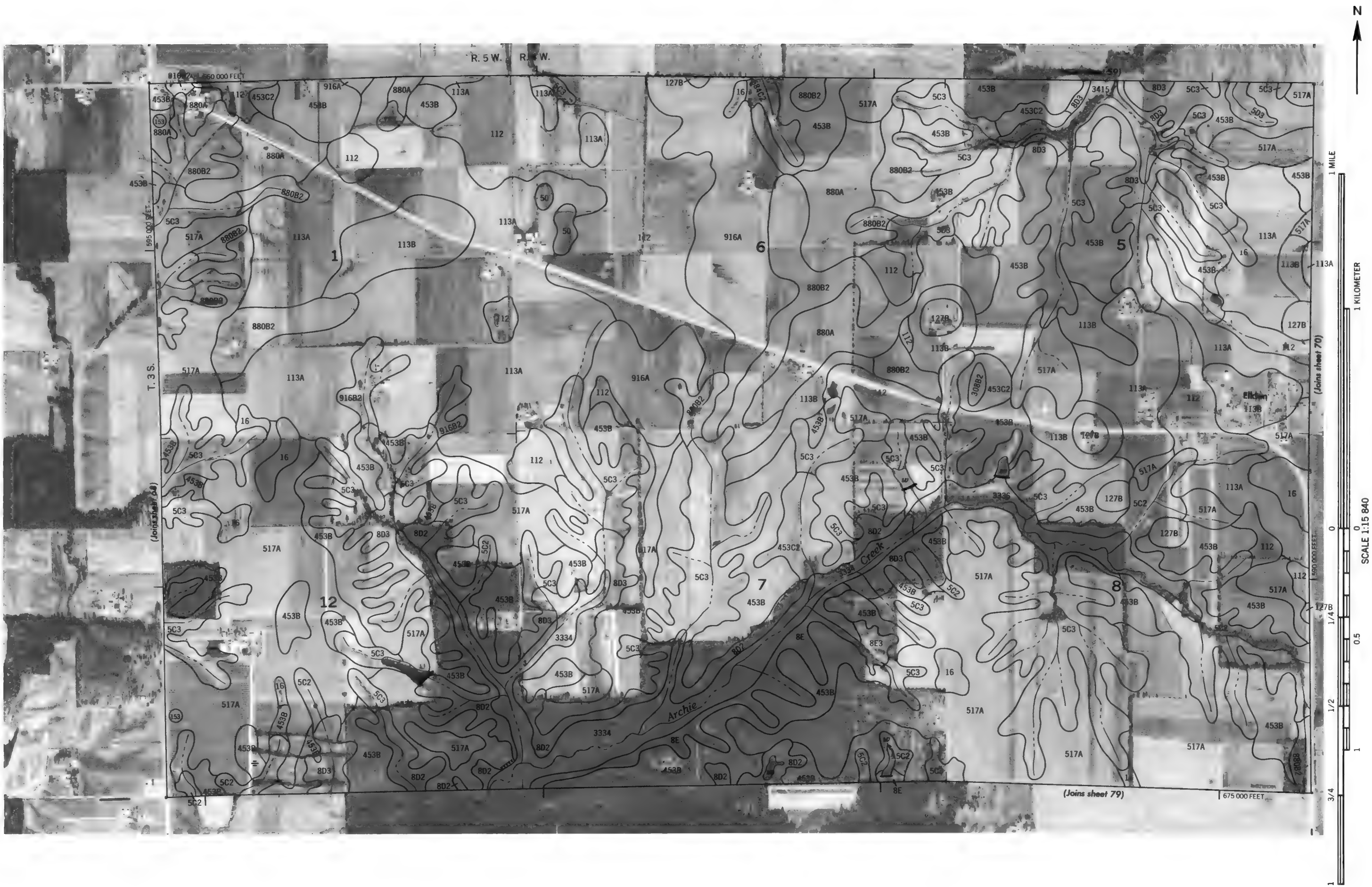
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



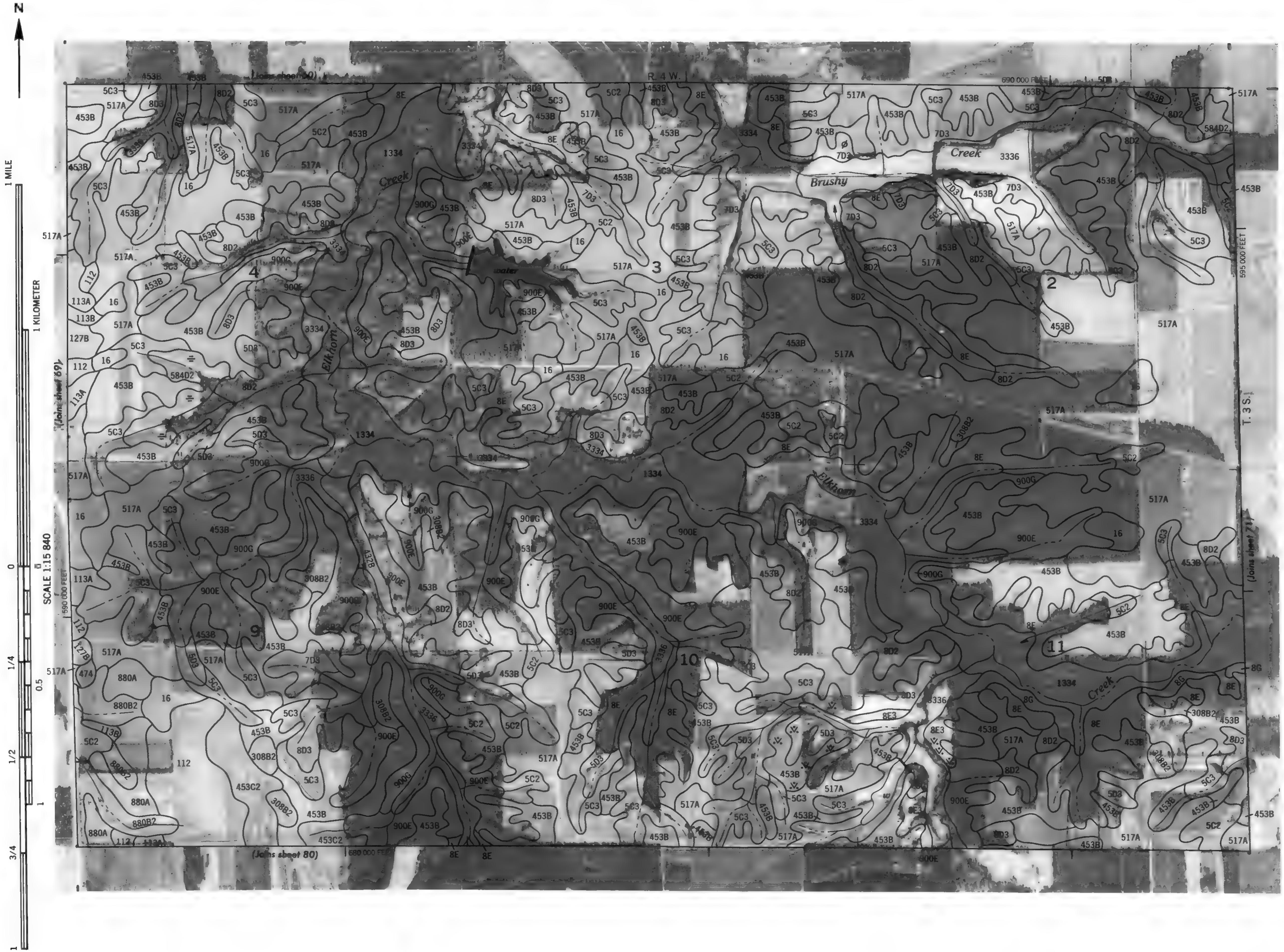
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



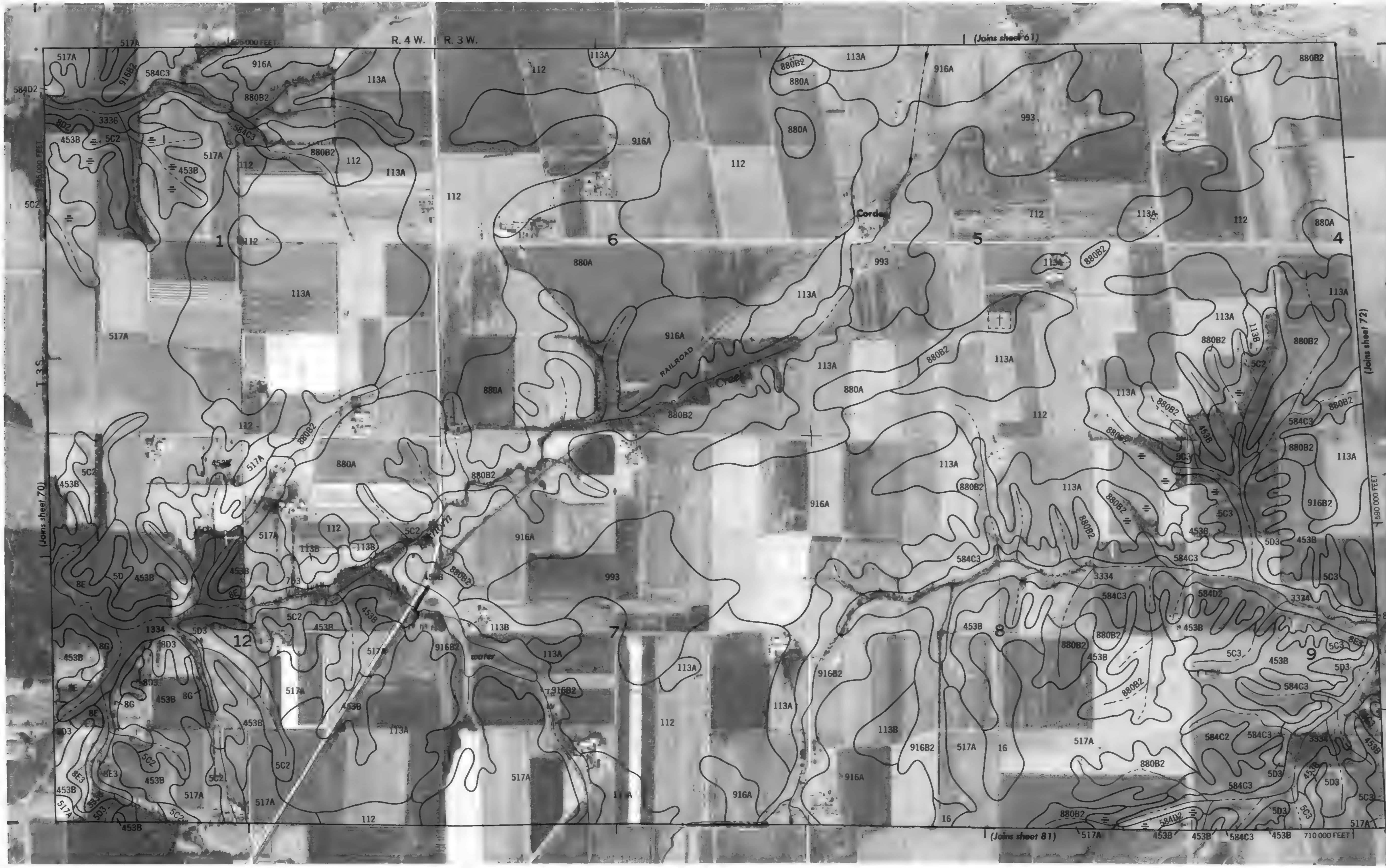
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

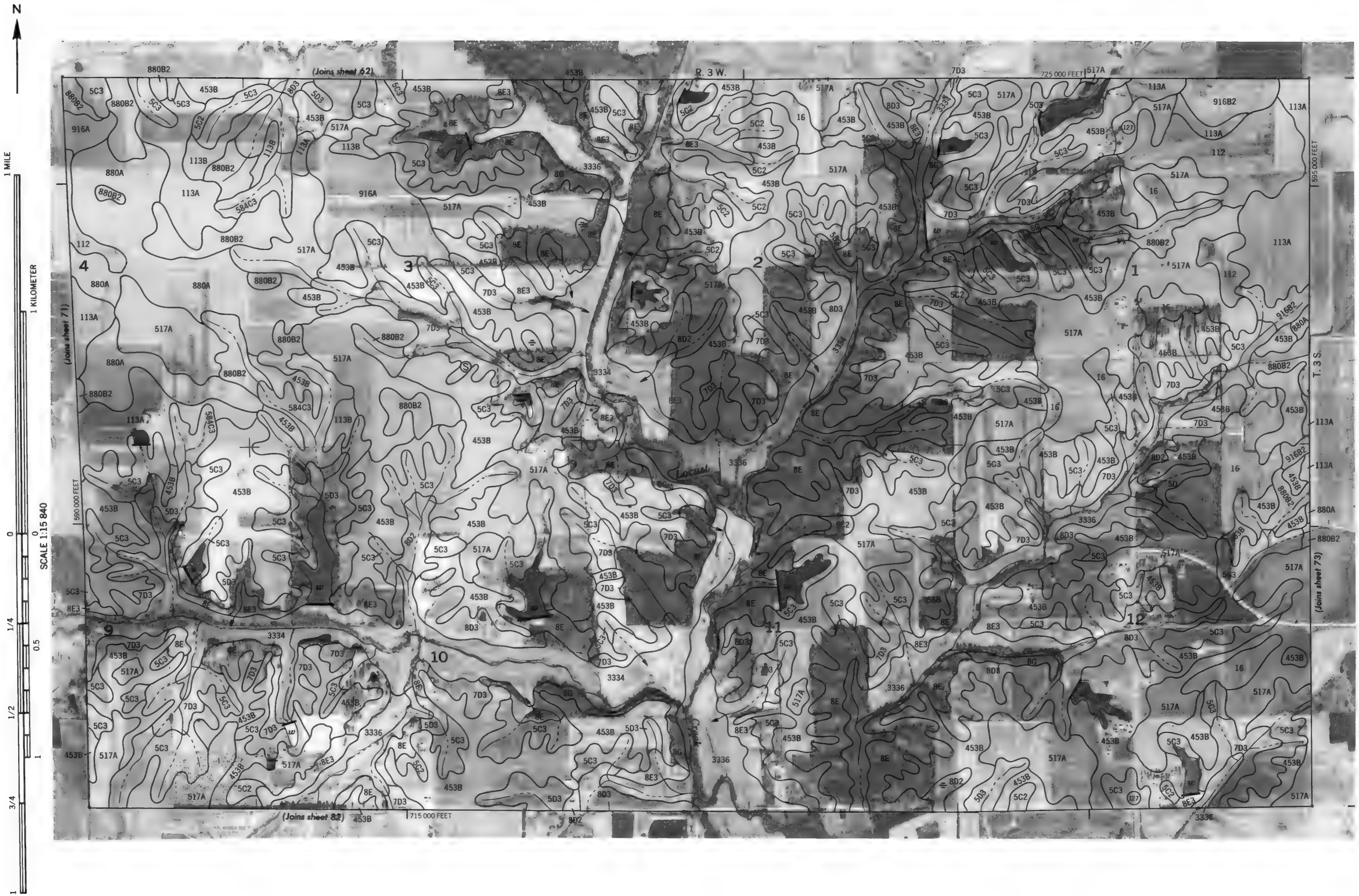
71

N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE

1 KILOMETER

SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1

74

N

1 MILE

1 KILOMETER

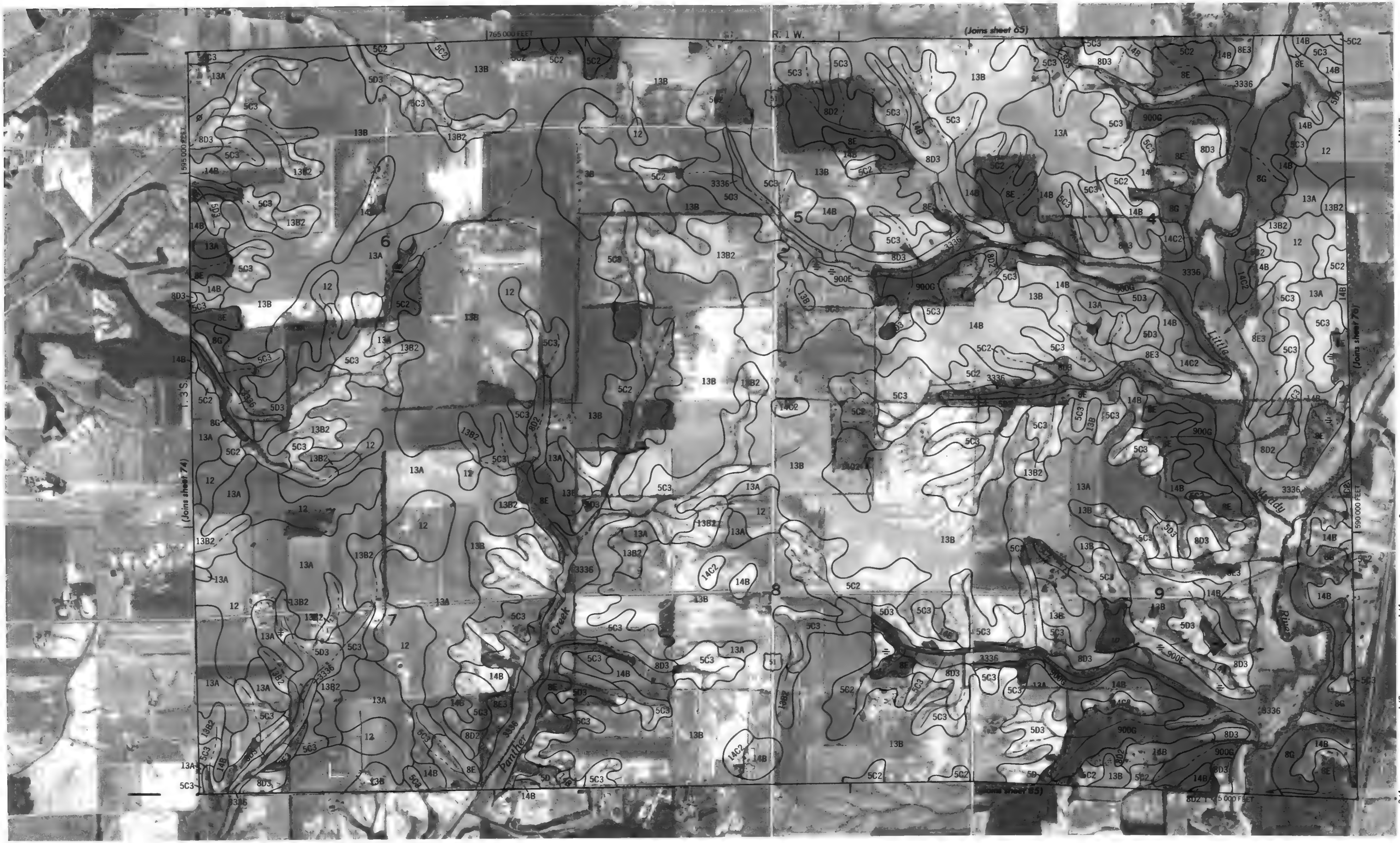
SCALE 1:15 840

0 1/4 1/2 3/4 1

0 0.5 1

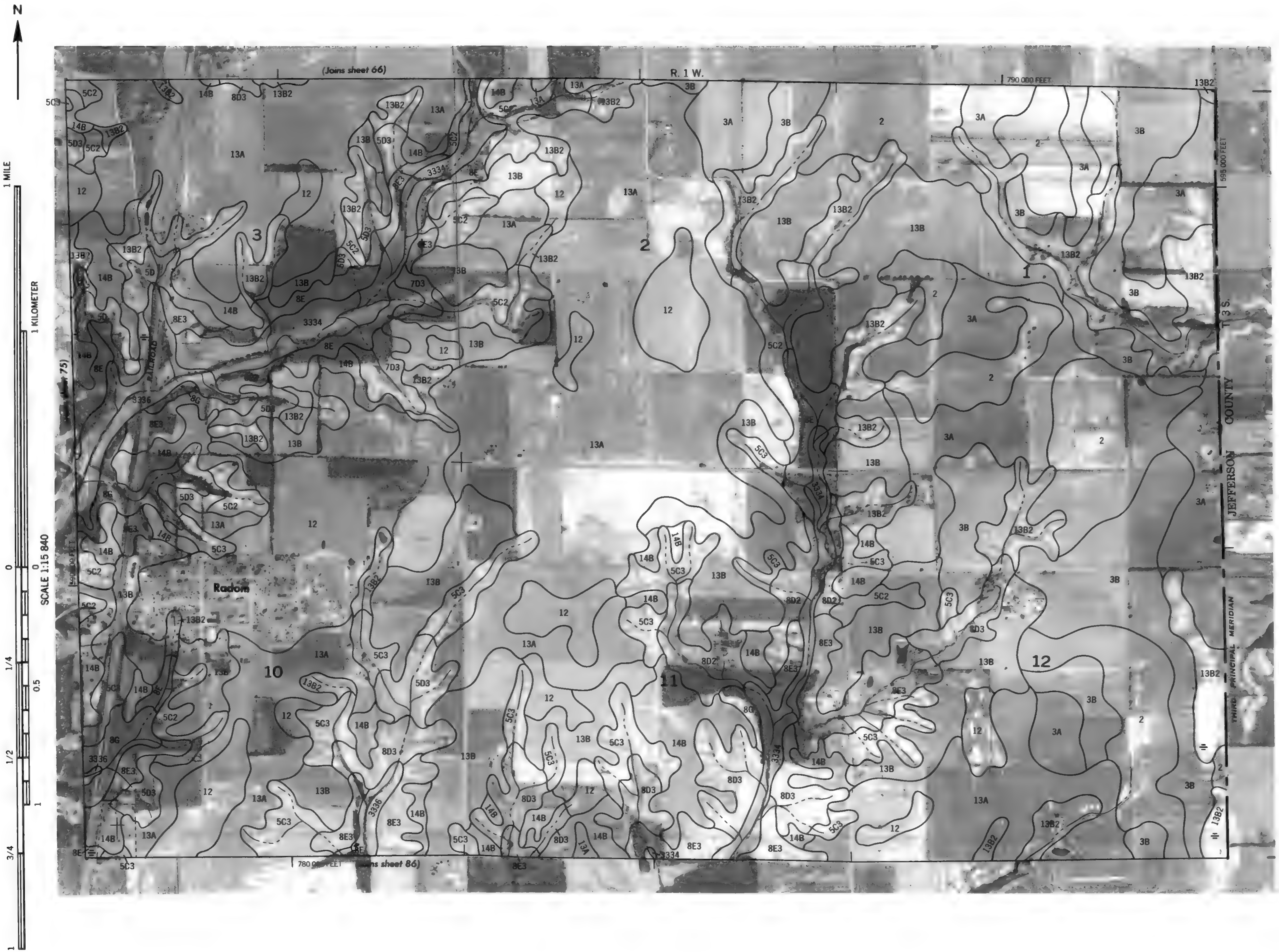
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



N

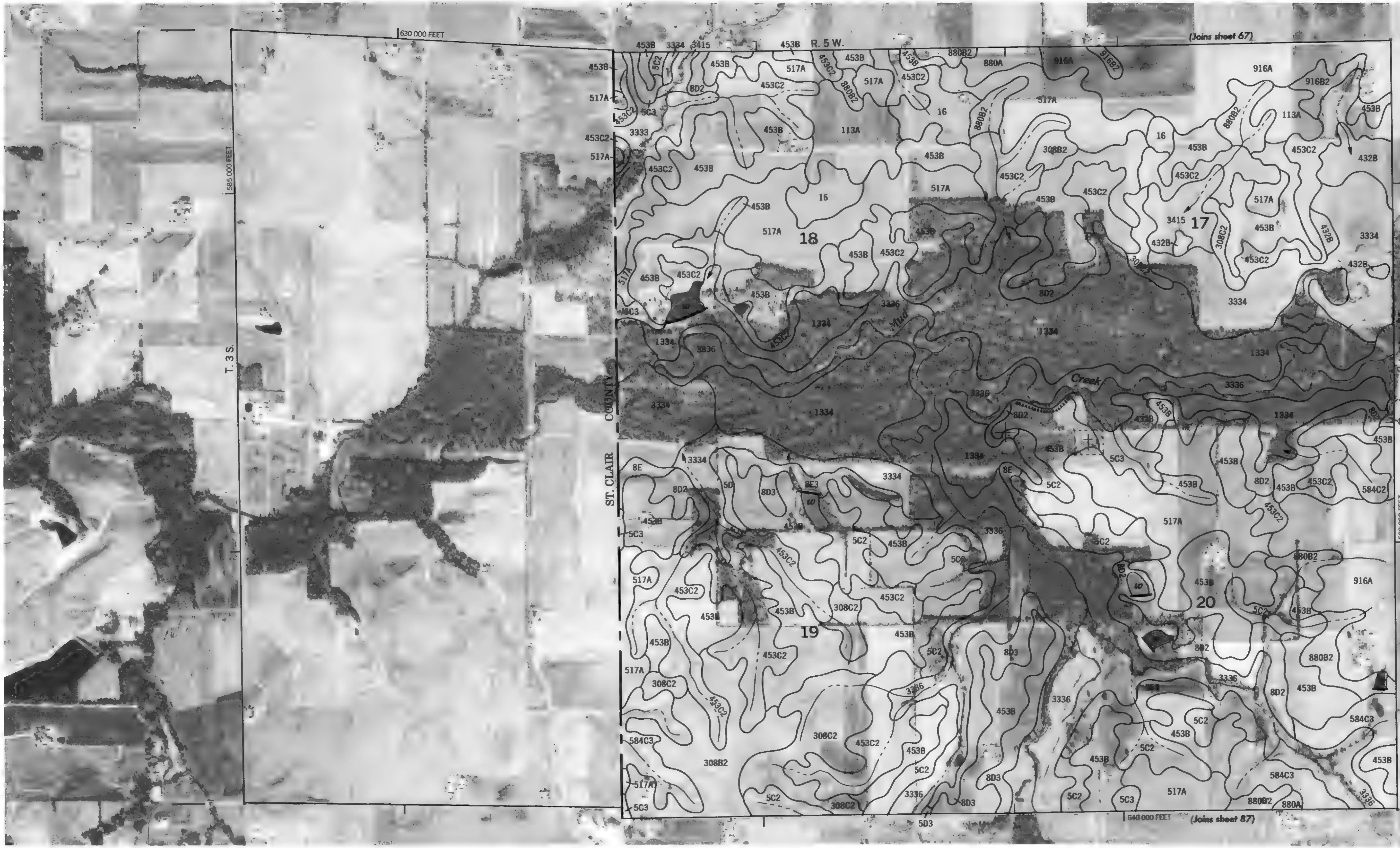
1 MILE
1 KILOMETER
SCALE 1:15 840
0
1/4
1/2
3/4
1
0
0.5
1



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

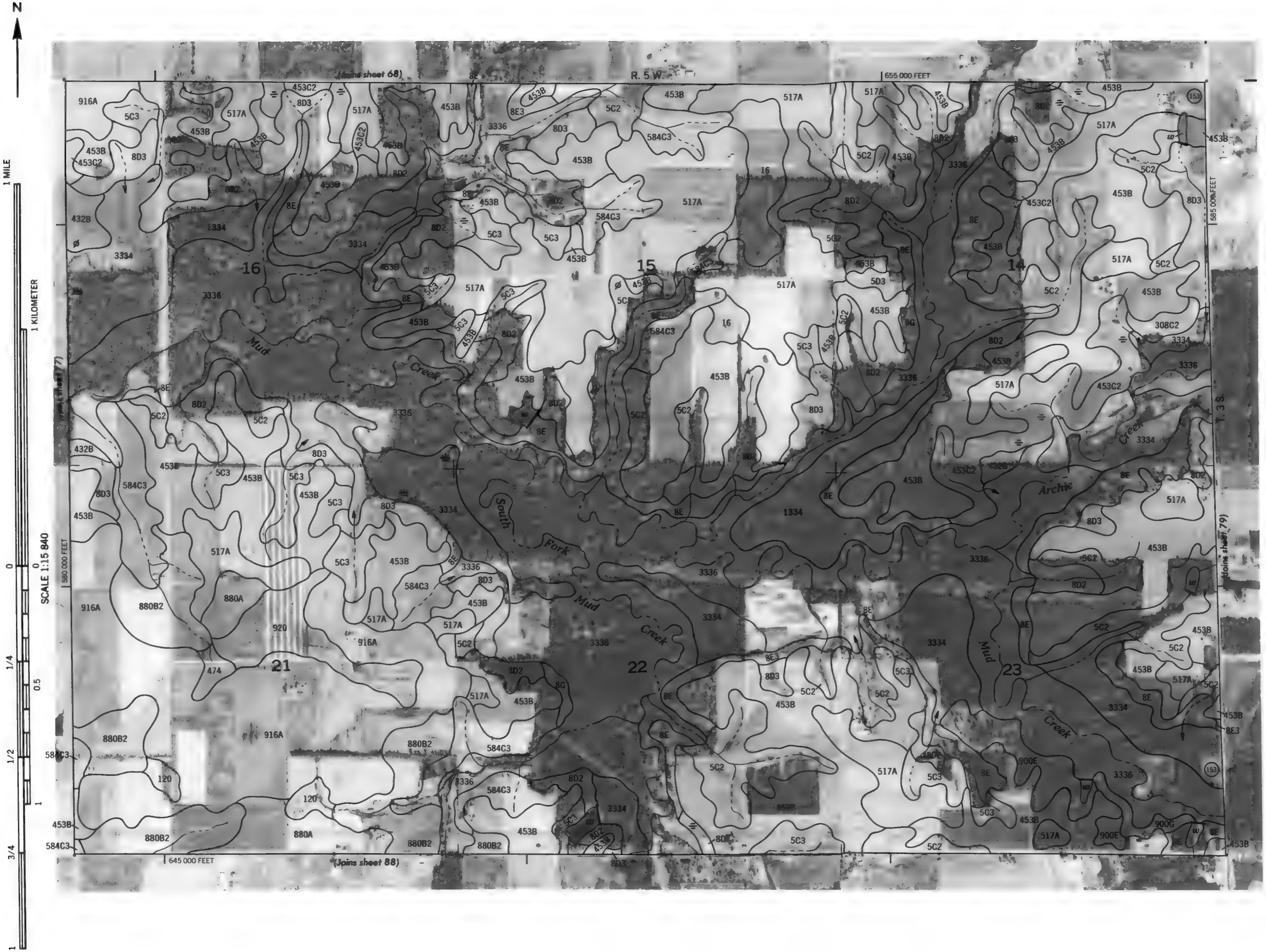
N

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.



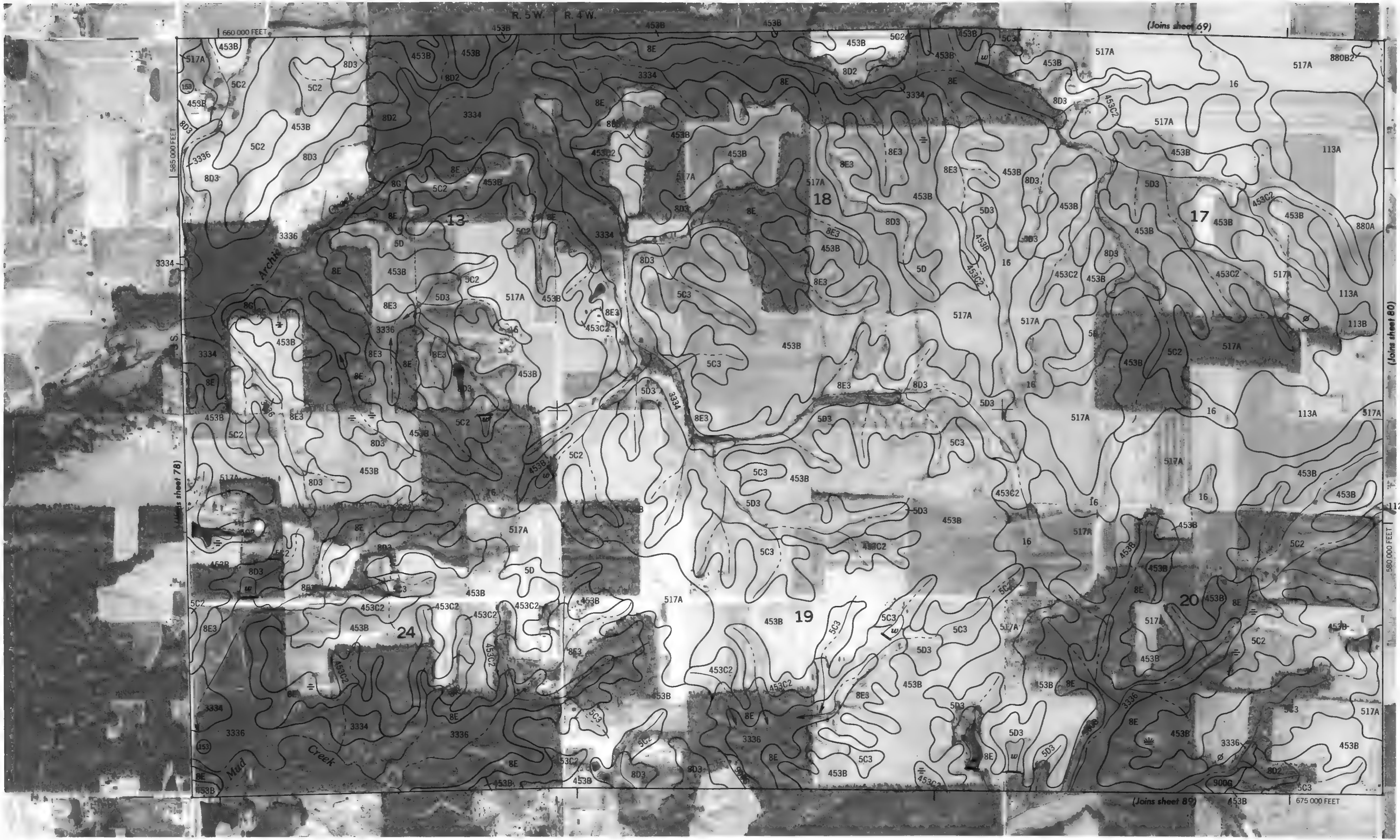
1 MILE
1 KILOMETER
SCALE 1:15 840
0 0 1/4 0.5 1/2 1 3/4 1

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 78



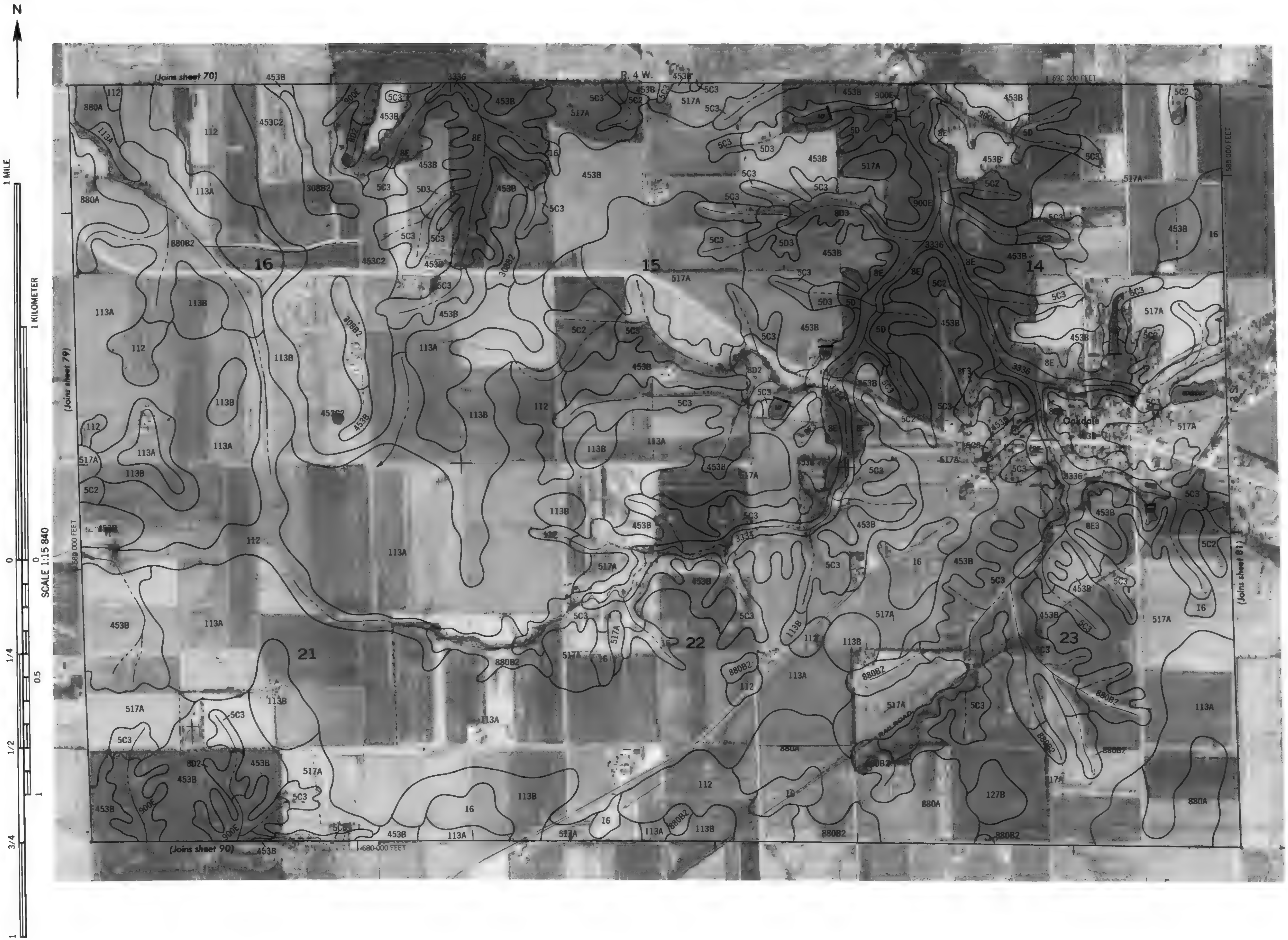
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE
1/4
1/2
3/4
1
0
1 KILOMETER
0
0.5
1
SCALE 1:15 840



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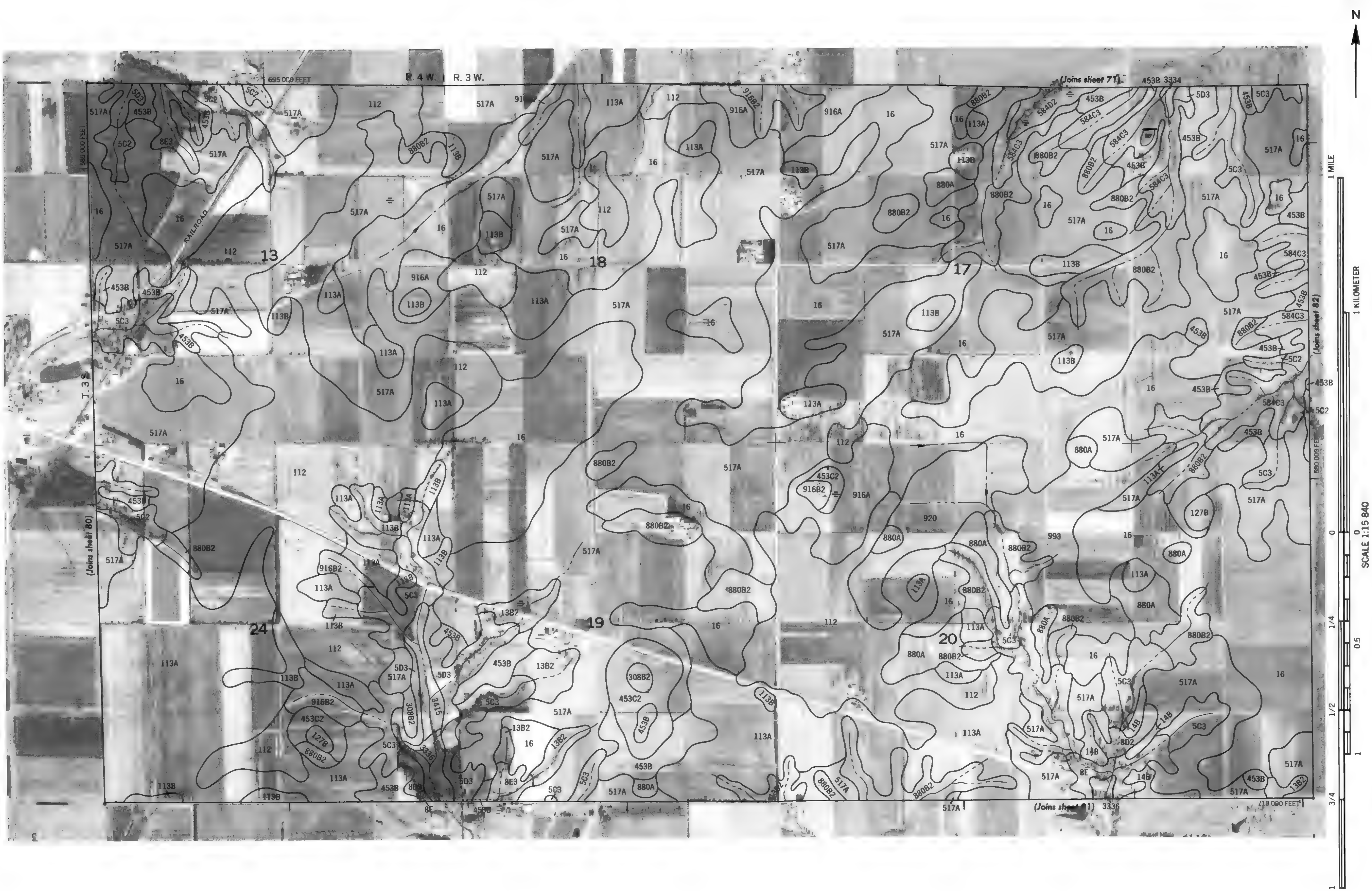

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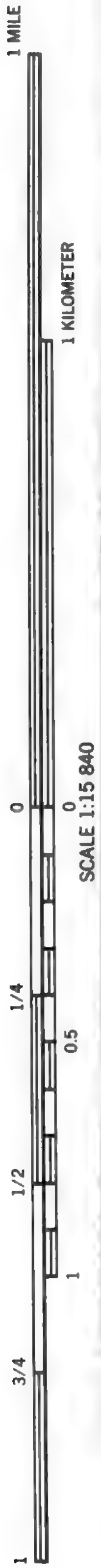
N



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N

1 MILE
1 KILOMETER
SCALE 1:15 840

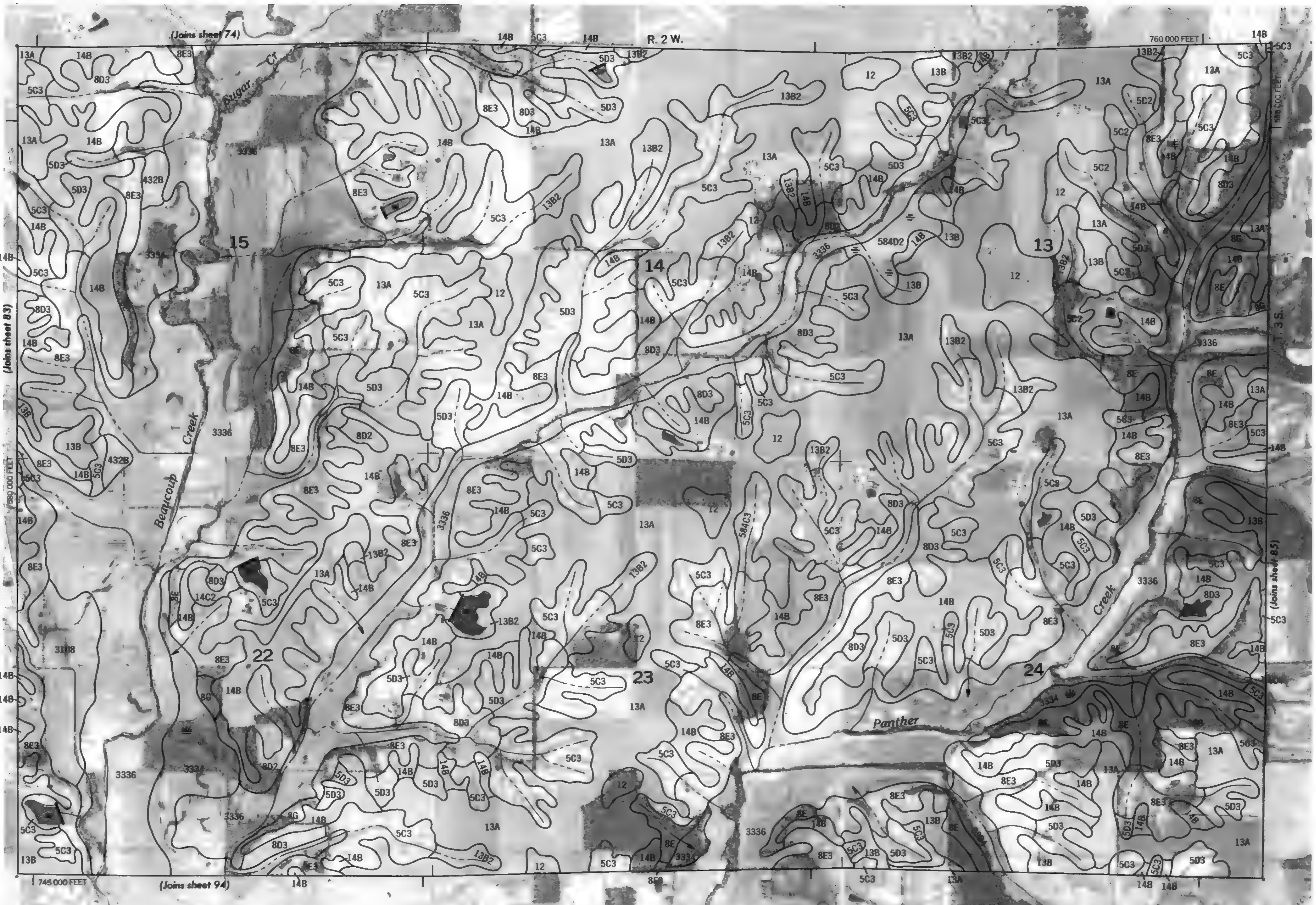
N

1 MILE

1 KILOMETER

SCALE 1:15 840

0 0 0 1/4 0.5 1/2 1 3/4 1



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N

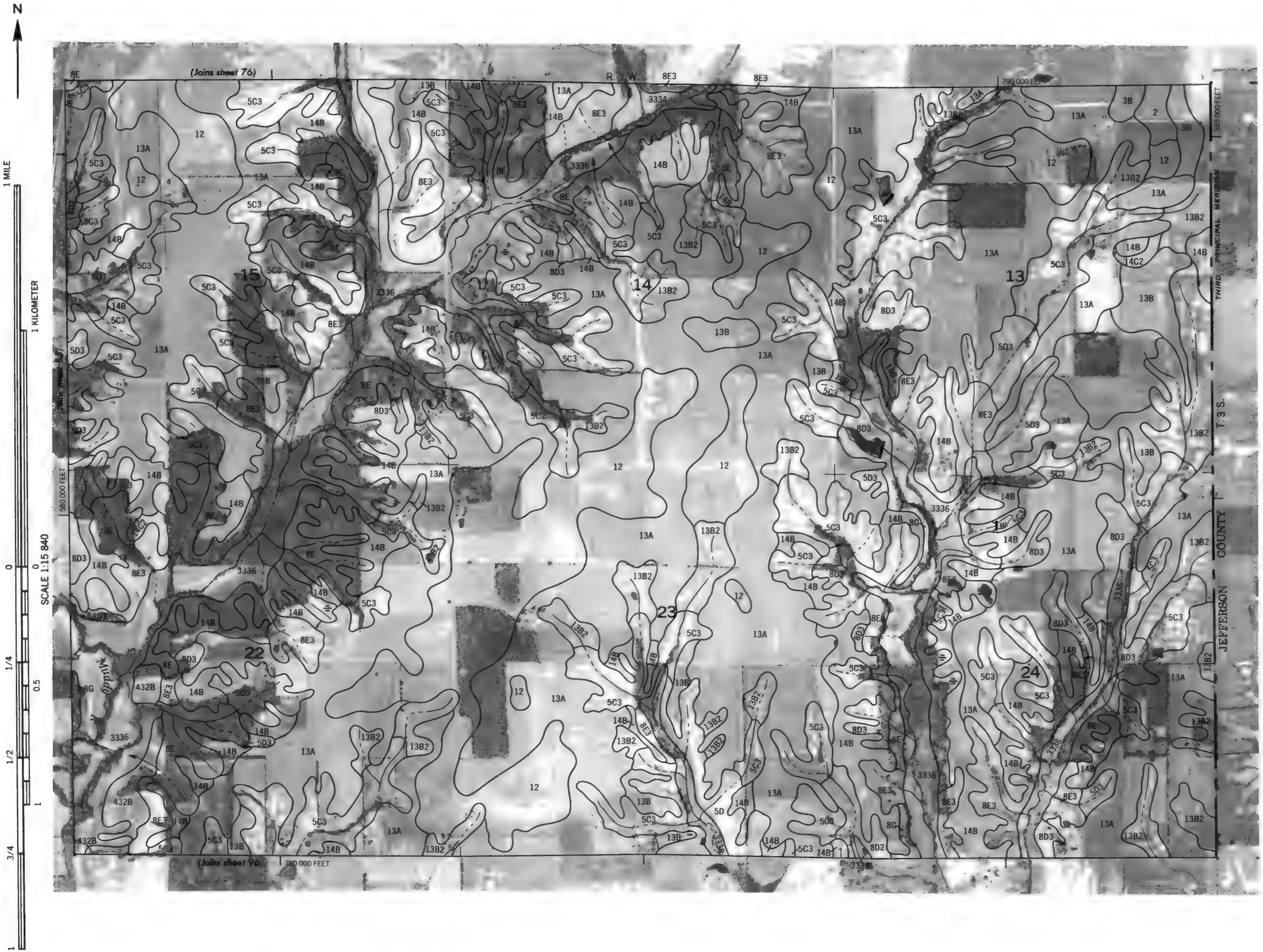
1 MILE

1 KILOMETER

SCALE 1:15 840

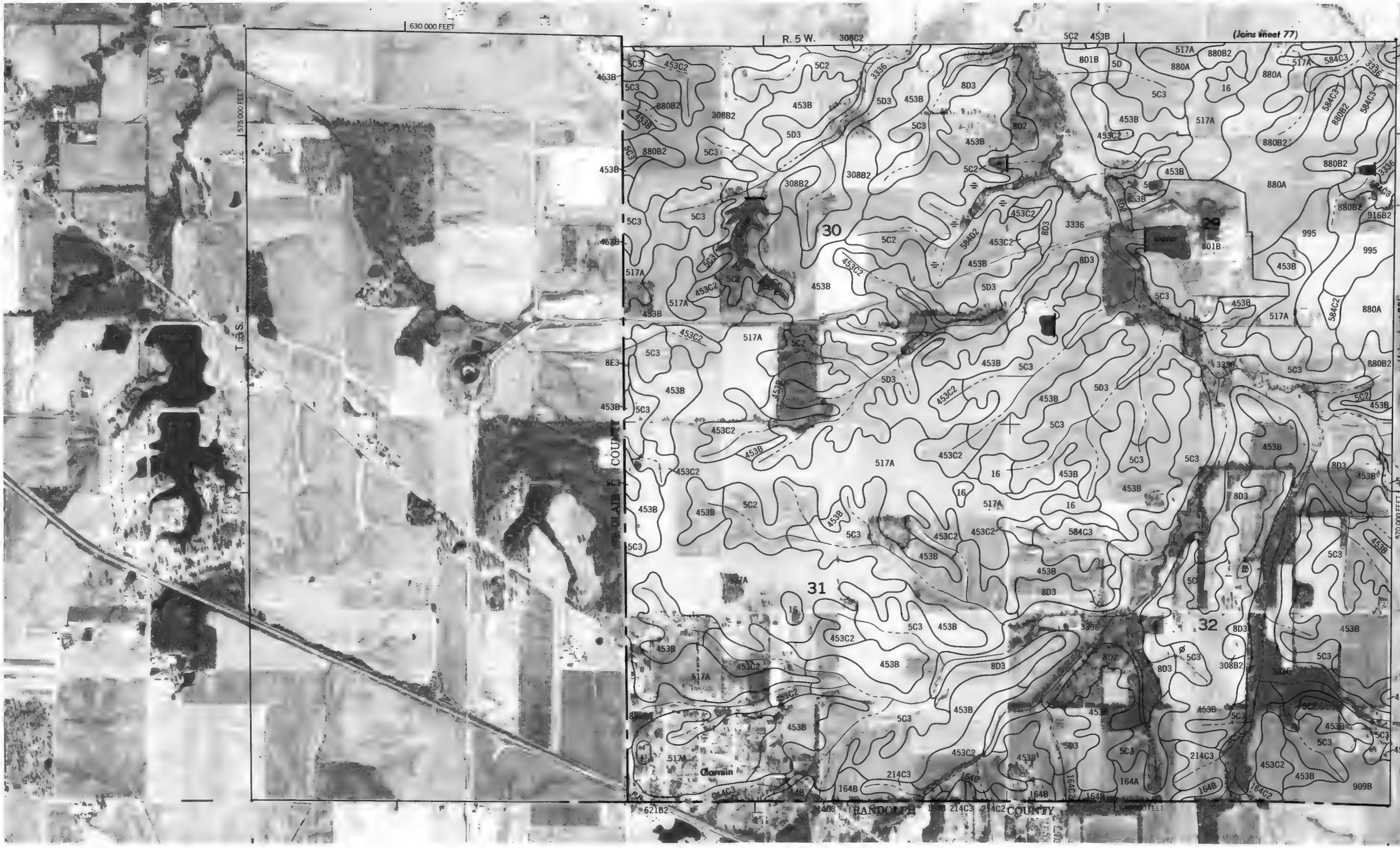
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 86



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N



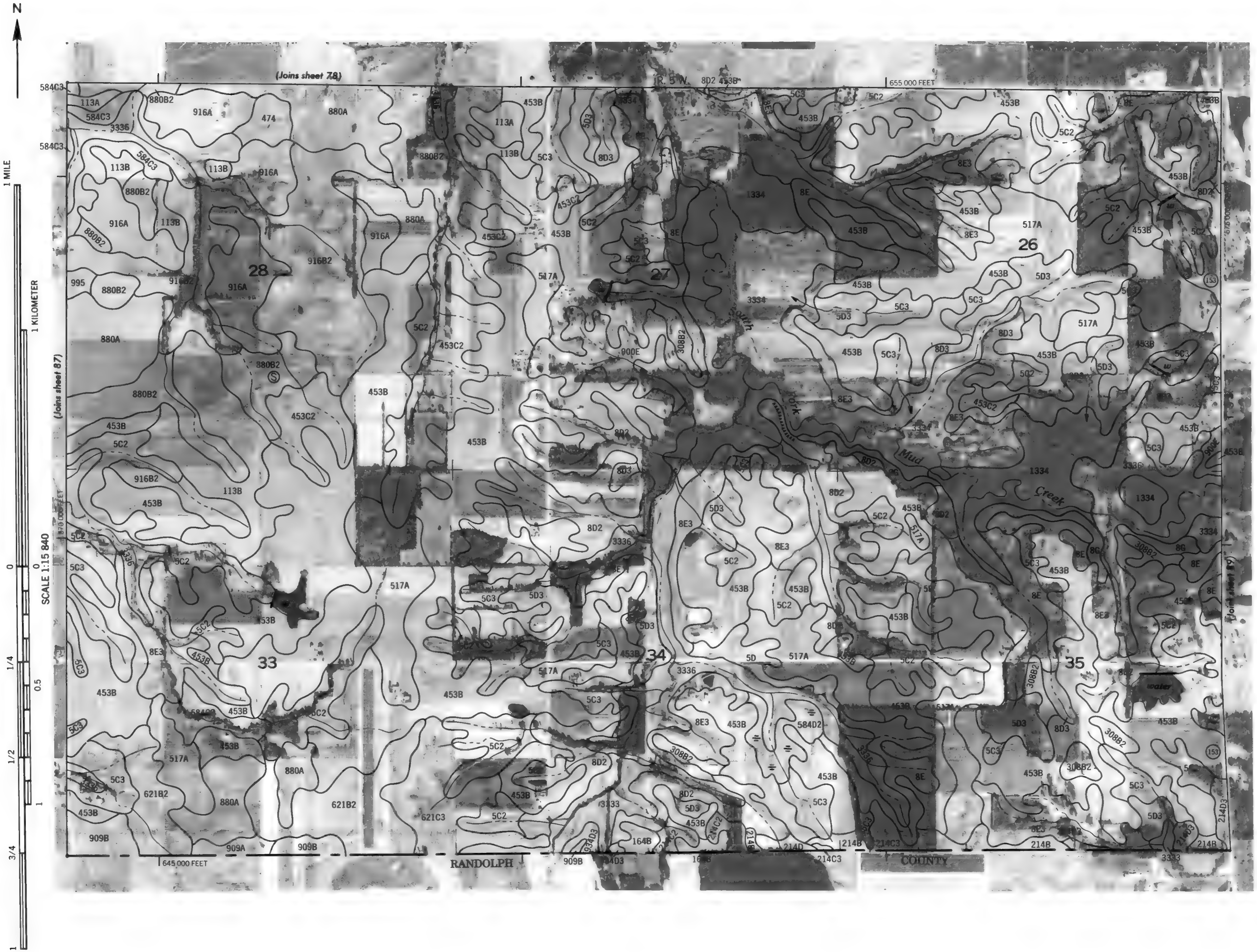
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE — 3/4 — 1/2 — 1/4 — 0

1 KILOMETER — 1 — 0.5 — 0

SCALE 1:15 840

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 88



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 · 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

N

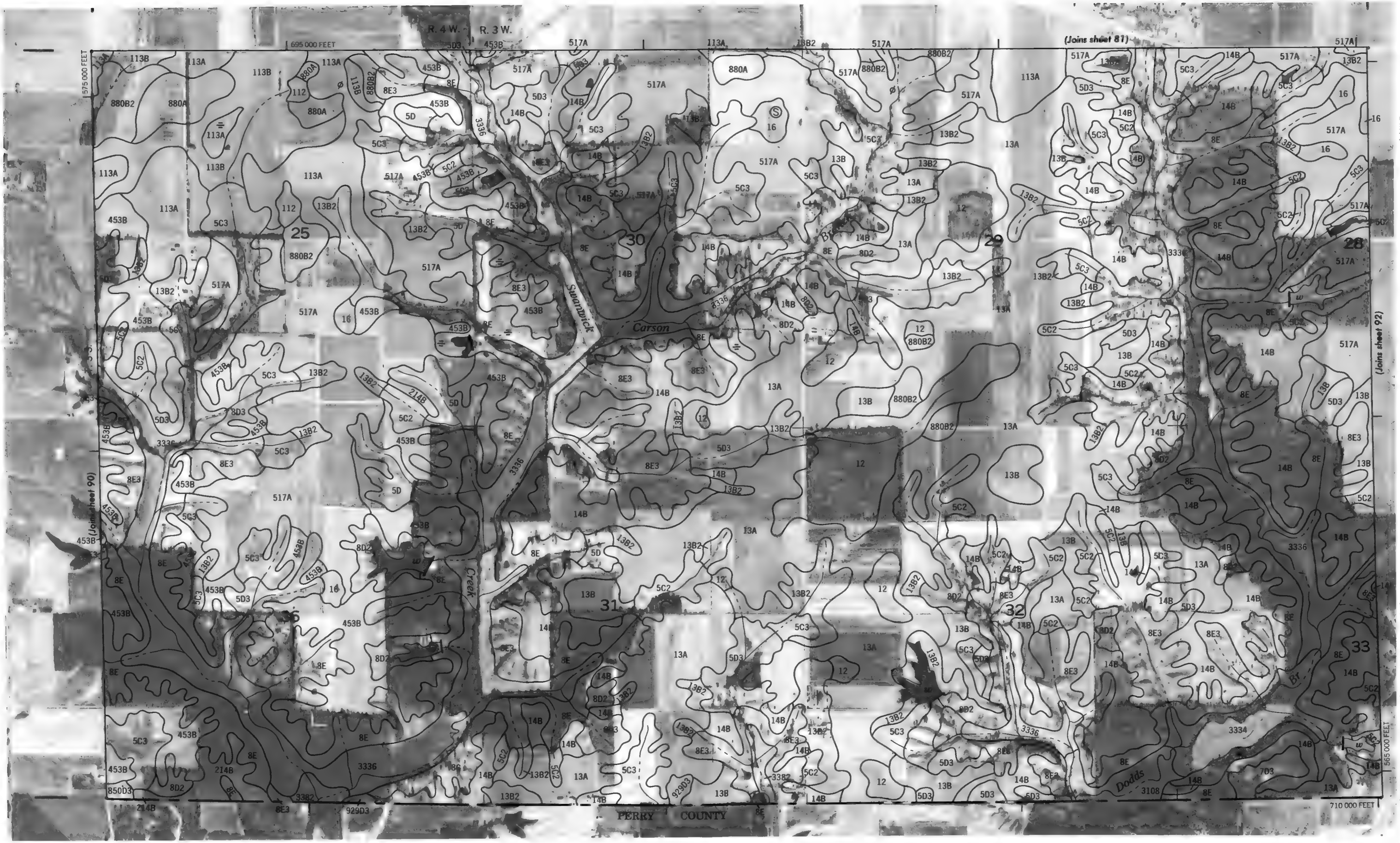
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

91

N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE

1 KILOMETER

SCALE 1:15 840

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93

N

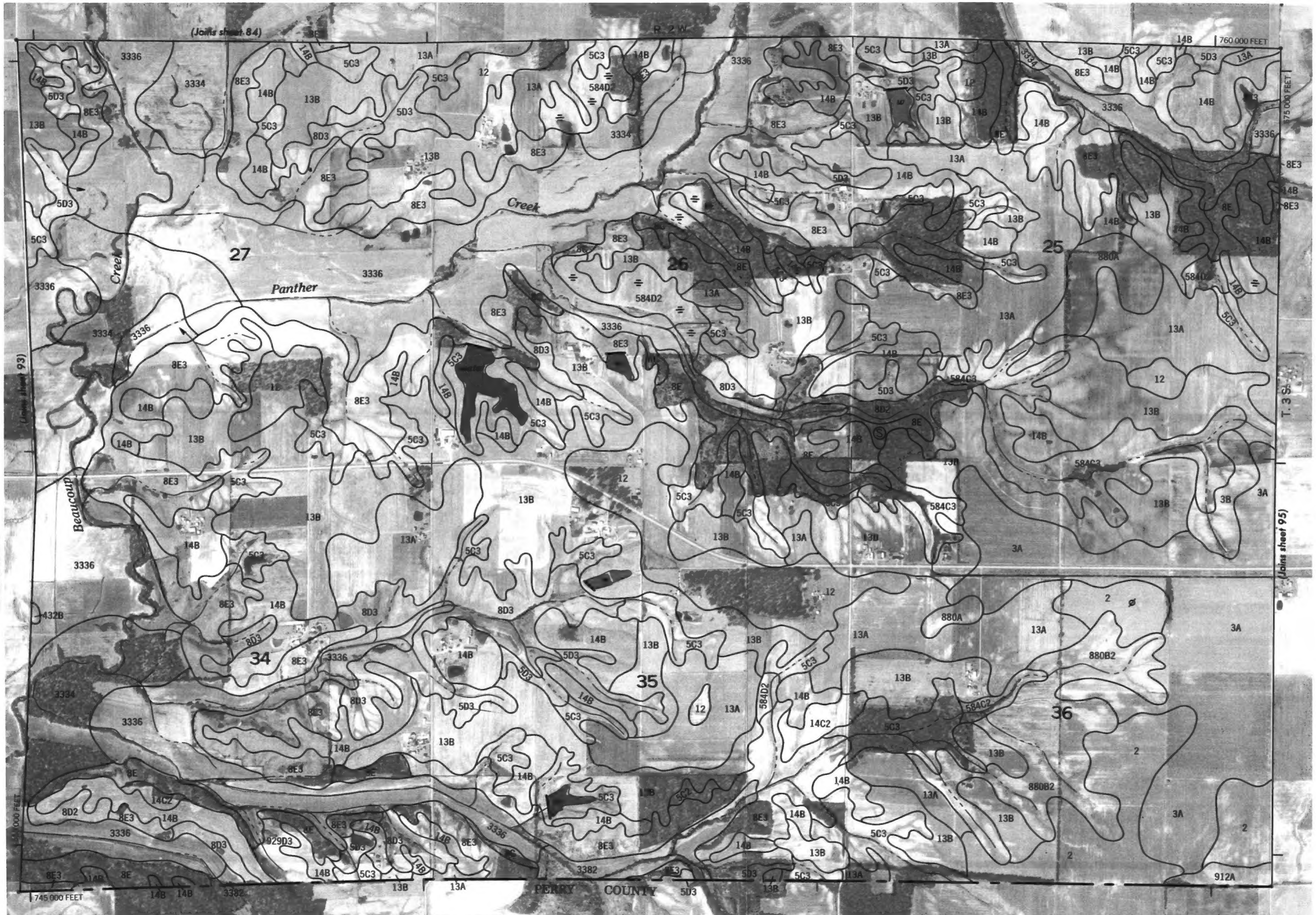
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

SCALE 1:15 840

1 MILE 0 1/4 1/2 3/4 1

1 KILOMETER 0 0.5 1

N



1 MILE

1 KILOMETER

SCALE 1:15 840

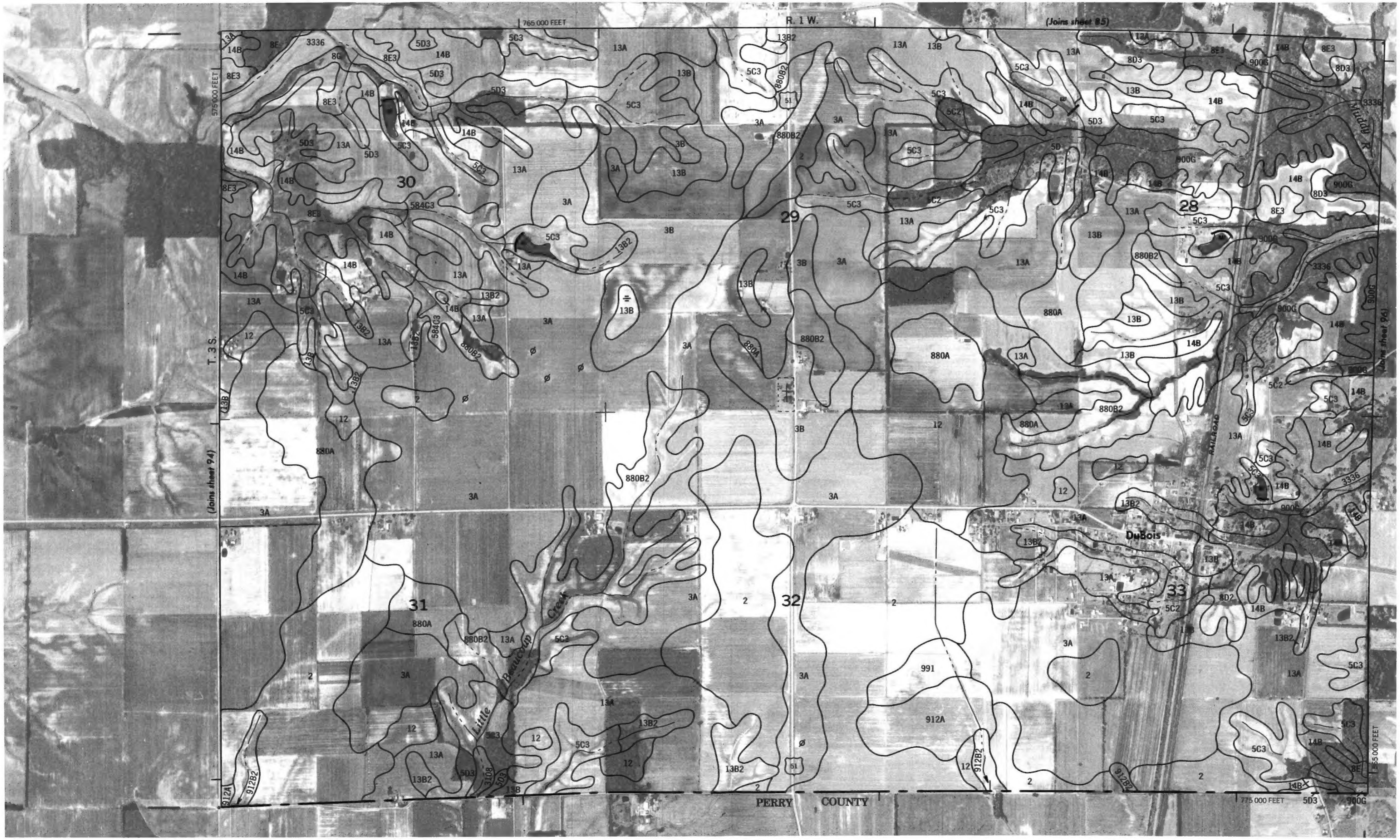
0 1/4 1/2 3/4 1

0 0.5 1

This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

95

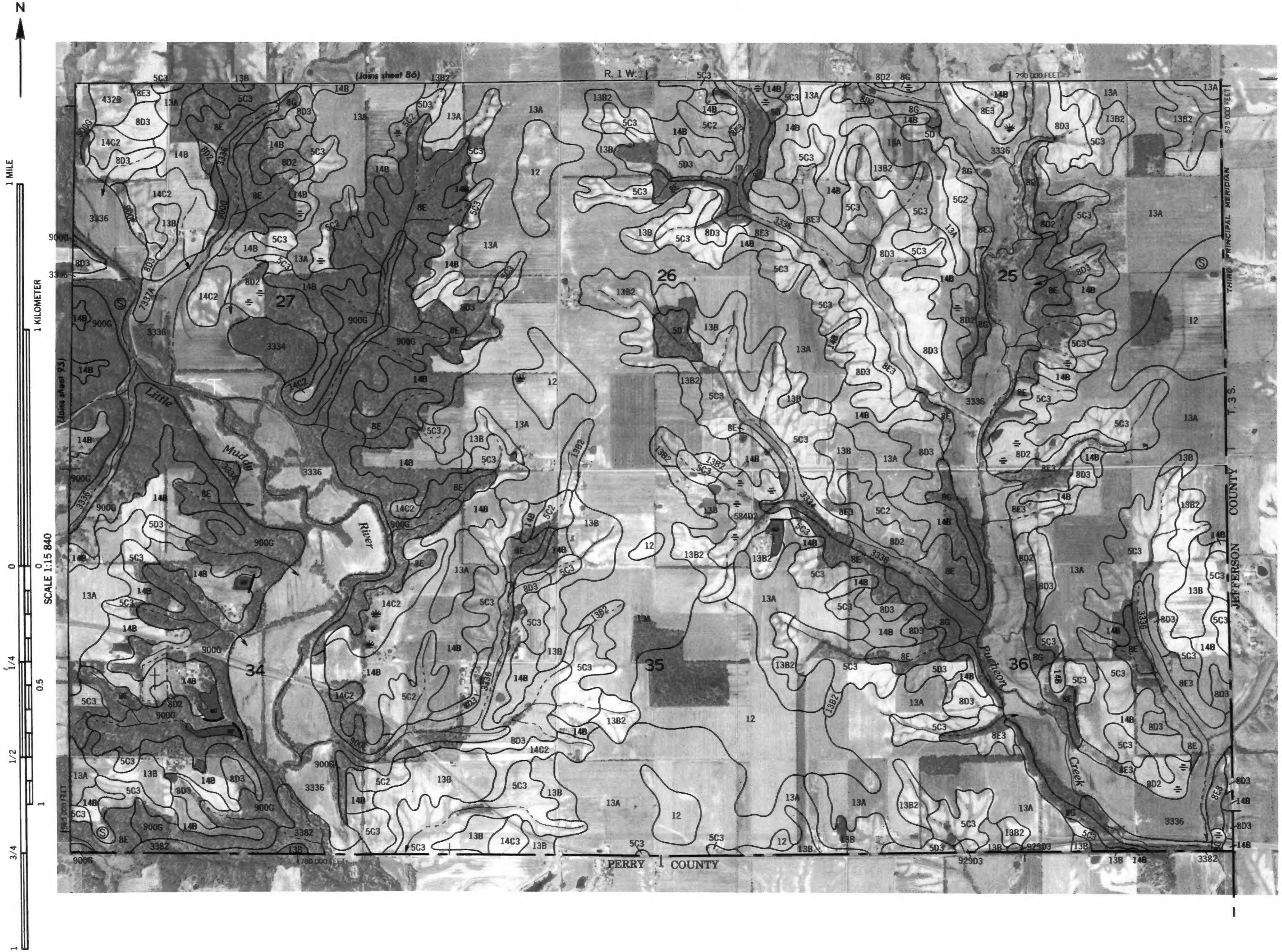
N



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

1 MILE
1 KILOMETER
SCALE 1:15 840
0 1/4 1/2 3/4 1
0 0.5 1

SOIL SURVEY OF WASHINGTON COUNTY, ILLINOIS — SHEET NUMBER 96



This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are prepared from 1981 - 1982 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.